Nursing World

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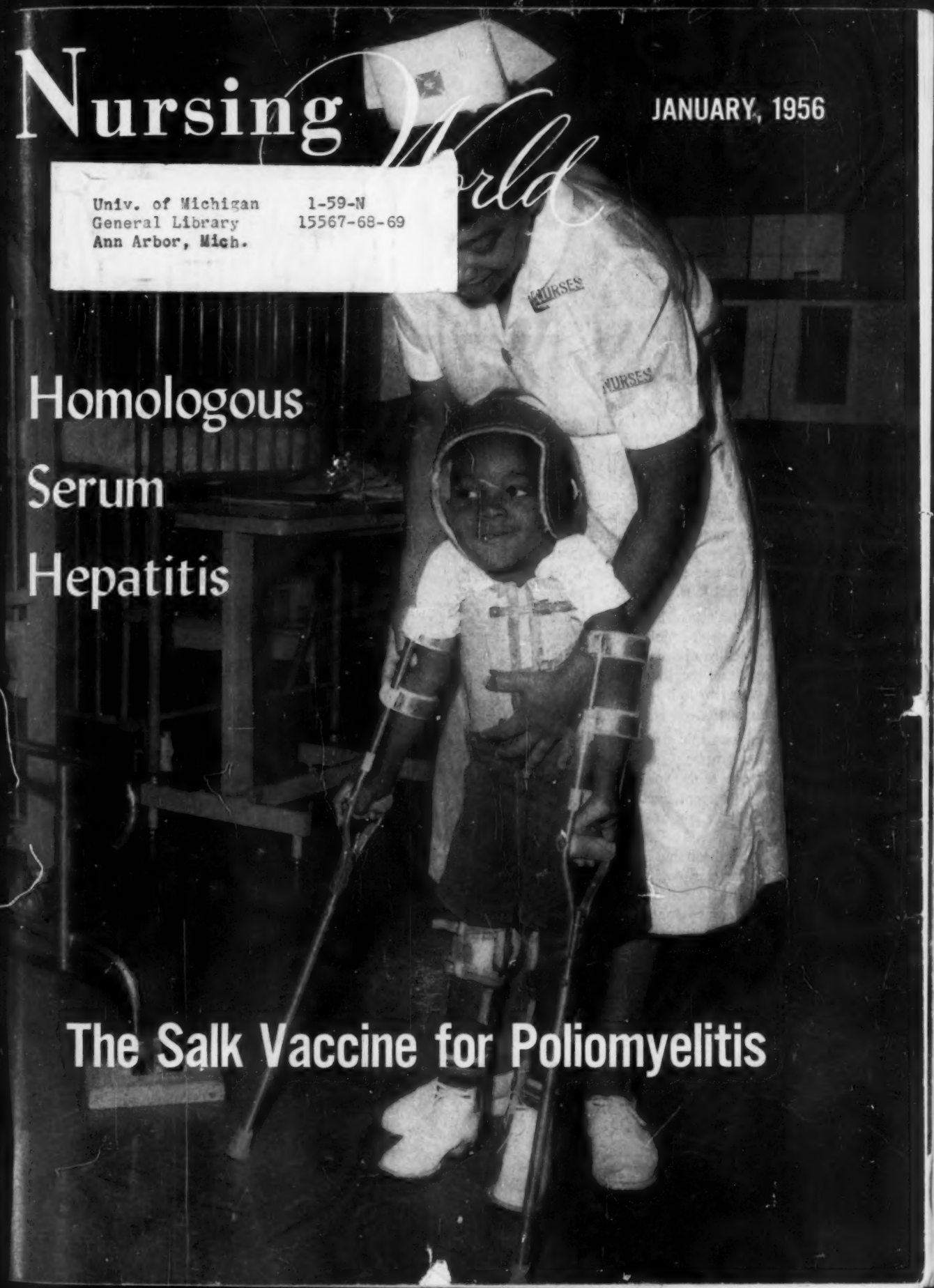

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CONTENTS

NURSING EDUCATION and NURSING SERVICE

Hon ologous Serum Hepatitis ..... *Amy Frances, Brown, R.N.* 12

CLINICAL NURSING

Practical Nursing in Influenza ..... *Ruth Boyer Scott, R.N.* 23

GENERAL INTEREST

The Salk Vaccine for Poliomyelitis ..... *Morris Greenberg, M.D.* 8

We Prepare for Polio Immunization ..... *Eugene O. Chimene, M.D. and Anna V. Matz, R.N.* 10

Twenty-Five Questions on Colostomy Management ..... *Lester Breidenbach and Sophia M. Secor* 16

DEPARTMENTS

In This Issue 5

NURSING WORLD Reports 6

Advances and Trends in Drug Therapy ..... *Joan Sarvajic, R.N.* 19

The Book Shelf ..... *Anna V. Matz, R.N.* 26

Practical Nursing Directory 27

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IN THIS ISSUE

COVER: The merry face of young John Anthony Clark suggests that he'll go far in his battle against the ravages of polio. Mrs. Gwendolyn Morris assists. Photo from National Foundation for Infantile Paralysis.

Few subjects are of greater interest than that of the Salk vaccine for poliomyelitis, and few authors are better qualified than Dr. Morris Greenberg to discuss its history and its present status (page 7). Dr. Greenberg earned his M. D. degree at the College of Physicians and Surgeons of Columbia University and the M.S.P.H. degree at Columbia's School of Public Health. He is Director of the Bureau of Preventable Diseases, New York City Department of Health, and Assistant Professor of Epidemiology at Columbia.

"We Prepare for Polio Immunization" (page 10) is a report by Dr. Eugene O. Chimene, District Health Officer, and Anna V. Matz, Public Health Nursing Consultant, New York City Department of Health. At the time of the immunizations, Mrs. Matz was District Supervising Nurse in the Corona-Flushing District Health Center.

Amy Frances Brown

Amy Frances Brown, R.N., widely-known authority on nursing and the teaching of nursing, adds to her already lengthy list of publications with an article (page 12) on "Homologous Serum Hepatitis." In addition to the degrees of B.Ed. and M.S. in Nursing, she holds diplomas and certificates for extensive graduate study. Teaching and writing are the major aspects of Miss Brown's career, but she has nevertheless found time for a remarkable amount of work with various professional organizations in the fields of nursing and education. Although this is her first article for *Nursing World*, we feel sure she is well known to our readers as author of *Medical Nursing* and *Clinical Instruction*, both published by W. B. Saunders Company.

Dr. Breidenbach

Sophia M. Secor

A surgeon and his patient, working out solutions to problems of colostomy management, found answers given here (page 16) for the benefit of other colostomy patients. Dr. Lester Breidenbach, graduate of NYU Medical School, is Attending Surgeon at Bellevue and Misericordia Hospitals, Associate Surgeon at University Hospital, and Director of Surgery at Beth David Hospital; he is also Associate Professor of Clinical Surgery at NYU. He has to his credit a long list of contributions to medical and surgical literature. His patient, Sophia M. Secor, B.A., M.A., is a high school teacher of vocal and orchestral music; this is her sixth published article on colostomy control.

Nursing World's semi-annual *Practical Nursing Directory* commences on page 27. Practical nurse associations are urged to send notice of any changes that may occur for insertion in the July issue.

Nursing World Reports

National: For the first time in medical history, Veterans Administration will make an extensive evaluation of mental patient care to determine what types of treatment and hospital best promote the improvement or recovery of its psychiatric patients and the relative costs. The study, as reported recently, will cover a five-year period. When it is completed, according to Dr. Jesse F. Casey, director of psychiatry and neurology service at VA, it should go a long way toward establishing psychiatric care on a much higher level of effectiveness and thereby speed the recovery or improvement of psychiatric patients at the least possible cost. Through the study, Dr. Casey explained, the VA hopes to be able to judge the effectiveness of other therapies in the treatment of patients in mental hospitals such as electroshock, group psychotherapy, individual psychotherapy, and the various programs of activity therapy now in use in VA hospitals. He further stated: "All of the hospitals cooperating in the project will collaborate in a general study of admissions for a two-year period. At the time of admission, each patient will be rated as to the type and severity of illness and on other factors potentially important for a forecast of the probability of recovery."

Education: The nursing picture in North Carolina is brighter now than at any time in the past and it will continue to improve, says F. Ross Porter who is the Superintendent of Duke Hospital. Mr. Ross lists several factors as being responsible for North Carolina's success in pulling ahead of most other states in their efforts to improve the nursing situation:

1. "Constant pressure for more nurses has had its effect in attracting larger numbers of girls into nursing. North Carolina now has more nursing students (3,000) in its 34 schools than any other state in the South. The demand for nurses has also forced reallocation of nursing duties for more efficient use of nurses. Duke Hospital, at present, has a staff of 183 graduate nurses and 103 trained practical nurses, marking the most complete nursing staff in its history.
2. "More nurses are staying in their home communities. One very commendable reason for this is that local communities which do not have nursing schools have been providing scholarships for local girls at nursing schools throughout the state, with the stipulation that they return to their communities and provide nursing service for a minimum specified time.
3. "More married nurses are working than ever before. Married nurses are going back to work to maintain the standard of living they want.
4. "Duke nurses have recently gone on a 40-hour week; the nursing service conducts a one-month orientation program for all new nurses; team nursing is providing better care for the patient and more job satisfaction for the nurse; and nurses have the opportunity to participate in postgraduate studies concurrent with their work," Mr. Porter explained.

An advanced training and research program in nursing for heart disease and other long-term illnesses that are major public-health problems is being developed by the Division of of Nursing Education of Teachers College, Columbia University, with an initial grant of $13,000 from the National Heart

Institute. The new project, an outgrowth of three years of experimentation by Teachers College in cooperation with the Public Health Service, represents the first attempt at developing nursing for heart disease and other long-term illnesses into major clinical nursing fields for graduate study.

Fellowships and Awards: The deadline for applications for National League for Nursing fellowships has been set as February 1, 1956. The purpose of the fellowships program is to assist nurses of proven ability to secure advanced preparation needed for administrative and faculty positions in nursing service and nursing education. The amount for each applicant may range from $3,000 to $5,000 a year, or somewhat higher in exceptional situations. The award may include, in whole or in part: maintenance, with consideration of personal obligations and other resources; tuition and other fixed university charges and the cost of typing studies. The term of the award (number of years) will vary with the individual's need. Applicants may choose the institution or institutions in which they wish to study. Applications for fellowships must be made in writing by the candidate to the National League for Nursing, Inc., New York 16, N. Y. Application forms will be sent upon request.

The Chicago Medical Book Company is sponsoring an essay contest for senior students in schools of nursing. The essay topic is "The Best Nurse I Have Ever Known." The essays will be judged on thought, originality, and composition. It is requested that each school submit two essays which the faculty considers to be the best. The deadline for submitting essays is February 1, 1956. The first three awards will be cash in the amounts of $150.00, $100.00, and $75.00. In addition there will be ten honorable mention awards of two books which the student may select from a list compiled by a nursing educator.

Lt. Commander Vera Thompson, U. S. Navy Nurse Corps, was awarded the 1955 Major Louis Livingston Seaman Prize on November 9, 1955. Commander Thompson, the first Navy Nurse to receive this honor, is Head of the Standards and Training Section of the Professional Branch of the Nurse Corps Division of the Navy's Bureau of Medicine and Surgery. The Major Louis Livingston Seaman award is given annually by the Association of Military Surgeons of the United States for some notable article published in *Military Medicine*, its official publication, in the current administration year. The prize consists of a scroll and an honorarium of $160. Commander Thompson's article, "Rehabilitation in Neurosurgical Nursing" appeared in the April, 1955, issue of *Military Medicine*.

Appointments: Mary Elizabeth Tennant, noted authority in nursing education and public health, has been appointed Associate Professor of Public Health Nursing at Yale University. As announced by Edgar S. Furniss, Provost of Yale University, Miss Tennant will hold a joint appointment on the faculties of the Yale School of Nursing and the Yale Department of Public Health.

Dorothy M. Smith, assistant director of nursing at Hartford (Conn.) School of Nursing, has been appointed Dean of the College of Nursing at the University of Florida. The College of Nursing at the University was created by Florida State Legislature in 1949, and will open in September 1956. It will offer a curriculum leading to a B.S. degree in Nursing.

Civil Service: The United States Civil Service Commission has announced an examination for Nursing Consultant in Maternal and Child Health for filling positions in the regional offices of the Children's Bureau located throughout the United States. The salary is $7,570 a year. Full information regarding the requirements and how to apply may be obtained at many post offices throughout the country, or from the U. S. Civil Service Commission, Washington 25, D. C. Applications will be accepted by the Board of U. S. Civil Service Examiners, Children's Bureau, Department of Health, Education and Welfare, Washington, D. C., until further notice.

Pamphlets: *Manual for Nurses on Arthritis and Related Disorders* is one of a list of 11 publications on the nature, care and treatment of rheumatic diseases now available at the New York Arthritis and Rheumatism Foundation, 432 Fourth Ave., New York 16, N. Y. The list of publications, including an order form, will be mailed free upon request.

Conventions: More than 3,000 surgeons, surgical specialists, nurses, and other medical personnel from Canada and the United States are expected to attend an intensive, four-day Sectional Meeting of the American College of Surgeons in Philadelphia, Pa., February 13-16, 1956, at The Bellevue-Stratford. Registration for the meeting will open at 3 P.M., Sunday, February 12th. Hotel accommodations may be requested from the Philadelphia Convention and Visitors Bureau, 17th and Sansom Streets. Information about Sectional Meetings may be addressed to: Dr. H. Prather Saunders, Associate Director, American College of Surgeons, 40 East Erie St., Chicago 11, Illinois.

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A Public Health Official and Educator summarizes the development and present plans for the use of

The Salk Vaccine for Poliomyelitis

by Morris Greenberg, M.D.

Director, Bureau of Preventable Diseases, City of New York, Department of Health.

THE year 1954 will go down in history as the year when a gigantic experiment to test the value of a vaccine against poliomyelitis was entered into by more than half a million children all over the United States, with the consent of their parents. Such a large-scale community experiment had never been undertaken before.

Before describing the experiment and its results, a little background history is necessary. The paralysis resulting from poliomyelitis was recognized even in antiquity, as can be seen in the art of ancient times. Instances of the disease were described by a number of persons in the 18th and 19th centuries. The first comprehensive monograph of the clinical aspects of the illness was published in 1840 by a German orthopedist, Jakob von Heine, who called the disease "spinal infantile paralysis." Oskar Medin of Stockholm studied the epidemiology of the disease and demonstrated damage to nerve cells in 1887. In Europe poliomyelitis is often referred to as "Heine-Medin's disease."

The first successful attempt to transmit the disease occurred in 1908 when Landsteiner infected monkeys with material from the brain and cord of a fatal human case and caused paralysis in the monkey. He was then successful in passing the disease from monkey to monkey, and established the fact that the agent was a filterable virus. Experimentation became possible, and it was greatly helped and extended after 1938 by the financial support of the National Foundation for Infantile Paralysis which was organized in that year by President Roosevelt.

For nearly half a century experimentation continued chiefly with monkeys. These animals are, however, large, expensive, capricious and difficult to obtain. Progress was slow but continuous. In 1939 Dr. Charles Armstrong was able to transfer the disease to mice, small animals that are cheap and easy to handle. More experiments became possible. However, only certain strains of the virus could be grown in mice, and this handicapped complete experimentation. In spite of these difficulties, attempts at the production of a vaccine were made. Brodie of New York and Kolmer of Philadelphia prepared vaccines in the early 1930's which were tried out in children. It was soon shown that they were not completely safe and their use was abandoned.

One of the great difficulties in working with viruses in the laboratory is their minute size, so that they cannot be seen with even the highest power of the usual microscope. One recognizes their presence only by the effect they have on living tissue. In recent years viruses have become visible under the electron microscope, which magnifies them about 50,000 times. Such microscopes are still not generally available and in addition, they require expertness in their manipulation. A second, and even greater, difficulty is due to the fact that viruses, unlike the common bacteria, do not grow on artificial media. They grow only in the cells of living tissue. For this reason all experiments with the poliomyelitis virus had to be made in animals, and the presence of the virus was recognized only by its paralyzing and other effects on the animal. In 1949 a remarkable discovery was made by Drs. Enders, Weller and Robbins of Harvard University, for which they later received the Nobel prize. It had been known for a long time that animal tissue could be grown in bottles by supplying it with the proper type of medium. Dr. Enders grew tissues from human embryos and from monkeys' kidneys in test tubes by bathing the cells with proper nutritional fluid. After the cells had begun to grow, he seeded them with poliomyelitis virus. The virus grew in abundance in the cells and spilled over into the bathing fluid. By filtering out the cells and debris he obtained polio virus in an almost pure form. A vaccine now became a practical possibility.

Two other major findings added to the probability that a successful vaccine could be produced. One was the completion, in 1951, of a huge task that had been undertaken by several laboratories in this country to classify the various strains of polio virus that had been recovered in this country and abroad. It was found that they fell into three basic types which were immunologically distinct. This meant that an individual infected with any one of the three types developed immunity to that type only, and could still be attacked by virus of the other two types. A vaccine, to be successful, must, therefore, contain virus of all three types. The second important discovery was made independently by Dorothy Horstmann of Yale and David Bodian of Johns Hopkins.

It had always been thought that polio virus travelled along the nerves leading from the periphery to the brain and spinal cord, and that it multiplied only in nerve tissue. This belief had been strengthened by the fact that many attempts to recover virus from the blood were only rarely successful. In 1952, Horstmann and Bodian independently reported that they had fed virus to chimpanzees and had begun to culture the blood soon after. Viremia was regularly present for a few days during the incubation period after virus feeding, but was not found after paralysis had set in. In humans, too, virus could be recovered from the blood in the first stage of polio before meningeal symptoms appeared. It could also be recovered from contacts who never developed clinical symptoms. It now became clear that poliomyelitis was a general infection, that viremia occurred regularly and that prevention of paralysis depended on blocking the virus from entrance into the nervous system. This could probably be done by developing an active immunity so that the virus entering the blood stream would be successfully inactivated by pre-formed antibodies. Such an attempt was made by Howe of Baltimore, who developed a formalin-killed vaccine of all three types, in 1951, and tested it in six children with favorable results in stimulating antibodies.

A number of other virologists were working on the problem, and the most successful of these in developing a killed vaccine which appeared to be safe and potent was Dr. Jonas Salk of Pittsburgh. He reported, in 1953, on the production of such a vaccine which had been tested successfully in ninety children. He cautioned, however, that considerable time would be required to study the vaccine before its use could be generally advised. By the next year, Dr. Salk had tested the vaccine in some five thousand children and had obtained good antibody response.

In the meantime, the National Foundation for Infantile Paralysis was making plans for a mass trial in the spring of 1954. Vaccine production was entrusted to six manufacturing laboratories, who were to produce it for the Foundation according to specifications on the basis of information furnished by Dr. Salk. Each lot of vaccine was tested for safety, purity and potency by the manufacturer, by Dr. Salk and by the Federal Public Health Service. The field trials were carried out in most states of the Union. In some, second-grade school children were inoculated and first- and third-grade children served as controls; these were known as "observed areas." In others, alternate children in grades one, two and three were inoculated with vaccine and with a solution similar to the vaccine which did not contain virus; these were known as "placebo areas." Approximately 200,000 children were injected with vaccine in the observed areas; in the placebo areas about 200,000 children were injected with vaccine and an equal number with the placebo material. During the rest of the year the children were observed. All cases of poliomyelitis occurring in children in grades one, two and three were carefully investigated and reports were sent to Dr. Thomas Francis, Jr., at the University of Michigan, who was appointed director of evaluation.

Dr. Francis' report was made on April 12, 1955. The vaccine appeared to be about 70 per cent effective in reducing paralysis. Furthermore, no deaths had occurred in vaccinated children, whereas fifteen deaths had occurred in the controls. The vaccine appeared to be most effective against type II virus and least effective (about 68 per cent) against type I. These results were very encouraging. No vaccine is 100 per cent effective, particularly in the beginning. The Foundation immediately ordered deliveries of vaccine to the states to inoculate the children who had participated in the experiment and had not received vaccine. The manufacturers, who had been producing vaccine on their own account, in addition to the orders placed by the Foundation, began to release vaccine to private physicians.

On April 26th disturbing news was received. Six cases of paralytic poliomyelitis had been reported in children inoculated with vaccine manufactured by the Cutter Laboratories. The Public Health Service immediately ceased licensing vaccine made by this company; vaccine already on the market was embargoed and an investigation was begun. On May 7th, the Surgeon General of the Public Health Service ordered all vaccine deliveries halted so that a reevaluation of production and safety measures could be undertaken. The new safety measures were announced about a month later and included more rigid methods of destroying the virus, testing of more and larger samples both during production and terminally, duplicate testing by the Public Health Service, a more careful check of each company's experience and the stationing of a Public Health Service scientist in each manufacturing plant to observe procedures. It is felt that these additional safeguards have made the vaccine as safe as a vaccine can be. Production has been slowed, as a result, but it is better to obtain safe vaccine slowly than vaccine of questionable safety quickly. Several million doses have already been used all over the country. It appears that sufficient vaccine will be freed for the needs of all children under twenty years of age before next summer.

What are the results of the vaccine in 1955? It will take some time to collate all reports made during the year. The polio surveillance unit of the federal Communicable Disease Center in Atlanta has been receiving reports of all cases of poliomyelitis in the states, with indications as to whether the children had been injected with vaccine or not. A report of the findings will be made. Tentative reports from various areas indicate that the vaccine has fulfilled its promise and that it has shown itself to be about 75 per cent effective in preventing paralysis. In New York City, for instance, comparison was made between 166,000 inoculated and 87,000 uninoculated children of ages six and seven. There were nine paralytic cases in the former and nineteen in the latter, as of October 28, 1955. This indicates rates of 5.4 and 21.8 per 100,000 respectively, or about four times fewer cases in the vaccinated than in the unvaccinated. Similarly, in upper New York State, there were fifteen paralytic cases among 351,000 children in ages 6-10 who were vaccinated, and sixty-two paralytic cases among 282,000 unvaccinated children of the same age.

Members of Dr. Jonas Salk's team giving polio vaccine to children at the Colfax Elementary School in Pittsburgh, Pa., during the vaccine trials.

rates of 4.3 and 22.0 per 100,000 respectively. This indicates more than five times as much protection in the vaccinated as in those not vaccinated. Most of these children received only one injection of vaccine. There were 98,000 children in the same age group who were vaccinated with three doses in 1954. Five cases of paralytic poliomyelitis occurred among them, a rate of 5.1 per 100,000. Apparently the children that received a single injection this year were as well protected as those that received three injections last year. Preliminary reports from other states indicate similar results.

Some physicians were worried about reactions to the injections. In New York City, parents were advised to inform the Department of Health if anything untoward happened after the injections, and a physician was sent to investigate each complaint. About 440 calls were received, but most of them were for conditions unrelated to the injections, such as colds, measles, chickenpox, etc. There were about twenty cases of sore arms and a similar number of cases of unexplained fever, which lasted a few hours to a day. Actually, there were fewer reactions than there are after injections of whooping cough vaccine.

There was also fear expressed by some physicians of allergic reactions to penicillin, since about 100 units are added to one cc. of culture medium. However, no cases of reactions to penicillin were encountered and one investigator actually skin-tested a number of allergic persons with penicillin, with negative results. Among them were two who were extremely sensitive to penicillin. He then injected these individuals with vaccine without obtaining any unusual reaction.

Much has been said about provocation. Several years ago investigators in England showed that if children developed poliomyelitis within a month after they had been injected with whooping cough vaccine or diphtheria toxoid, there was a greater likelihood of their becoming paralyzed in the injected limb. Their work was confirmed in this country, and was later shown to be true experimentally in the monkey, also. For this reason, health departments advise against giving immunizing or other elective injections during the polio season. The question arose last summer whether injection of polio vaccine might not cause a similar phenomenon. Experts were divided on whether to advise injections during the summer or not. Some felt that more children would be protected against paralysis than would become paralyzed as a result of the injection. Others felt differently. It was left to the individual health officers to decide whether injections should be given in the summer, or not. In New York City, injections were not advised.

The Congress has appropriated $30,000,000 for the purchase of vaccine by the government; it will be allocated to the states on a formula which takes into consideration the ratio of the number of children under twenty years of age in the state to the total number of that age in the country. On the basis of the formula, New York State has received $1,700,000. The Federal Government permits each state to decide on the method of allocation of the vaccine to the local communities, so long as it is used for persons under twenty years of age and pregnant women, and so long as no means test is used in its distribution. Methods of use vary in the different states. Some have allocated all the vaccine to the local health departments for use in their programs. Some have distributed all the vaccine to private physicians to be used for their patients in the recommended age group. Some have allocated part to public agencies and part to private physicians. In New York State, a decision was made to use the vaccine received to immunize children in the first priority, which is the 5-9-year age group. The vaccine is distributed to local health departments in accordance with the ratio of children of that priority to the total in the state.

The local health department decides whether it will establish clinics for the injections or whether it will distribute the vaccine to the local physicians for them to use in their practice. No child in the priority group will fail to get vaccine because it cannot afford it.

As more and more vaccine is produced, more becomes available. The priorities will be widened. The time is not far away when sufficient vaccine will be produced so that all who want it can get it. In New York City, a list of priorities was established early in the program when it was realized that vaccine would be tight in the first few months. This list was based on the incidence of poliomyelitis in different age groups. The first priority was the 5-9-year age group. Next followed age groups 1-4, 10-14, and 15-19. A fifth priority was pregnant women. It is known that pregnant women are twice as susceptible to poliomyelitis as non-pregnant women of the same age, but the risk of pregnant women is, nevertheless, less than that of children 15-19 years of age. Infants under 1 year of age make up a very small percentage of all poliomyelitis cases and should be given no priority. When vaccine becomes freely available, it may be advisable to inoculate all persons between the ages of 6 months and 45 years.

What of the future? There is no question that the killed vaccine will continue to be improved so that it will be more than 70 per cent effective. In the meantime, much experimentation is going on in laboratories to produce an (attenuated) living vaccine similar to what we have in smallpox and in yellow fever. Many scientists feel that such a vaccine is more effective than a killed vaccine. In some laboratories active experimentation is proceeding to produce a vaccine which can be taken by mouth rather than by injection. Studies are also progressing to make the vaccine sufficiently effective so that it will prevent nonparalytic as well as paralytic poliomyelitis. At present the vaccine prevents paralysis but does not prevent the multiplication of virus in the vaccinated person. All these are in the distant future. In the immediate future, many health departments are planning to introduce the Salk vaccine into their regular immunization program. Young children will be vaccinated against poliomyelitis just as they are now immunized against smallpox, whooping cough and diphtheria. Certainly the future is bright and we can look forward hopefully to the conquest of one more of man's enemies.

These children are holding cotton on their arms after receiving injections of trial polio vaccine in the Sunnyside Elementary School, Pittsburgh, Pa.

Carefully planned schedules and accurate record-keeping are of great importance when

We Prepare for Polio Immunization

by Eugene O. Chimene, M.D. *District Health Officer*
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IN the spring of 1954 the Corona-Flushing Health District was selected as one of five such districts in New York City to test the efficacy of Salk vaccine in the prevention of paralytic poliomyelitis. The tests were sponsored by the National Foundation for Infantile Paralysis, which furnished the vaccine and supplies. The program was under the supervision of the bureaus of school health and of preventable diseases of the Department of Health of New York City, which assigned doctors and nurses to each school in the district to supplement the regular staff. There were 34,000 pupils in the first three grades of its 90 schools. From about 20,000 of them parental requests were received for the free inoculations, either of the vaccine or of a placebo control solution.

When the report of the efficacy of the vaccine was made on April 12, 1955, the National Foundation for Infantile Paralysis offered free vaccine to children in the first and second grades of all schools and to the children who participated in the 1954 trials and did not receive vaccine. The Department of Health organized the clinics and contributed all personnel and supplies.

Continuation Program

Unlike the trial program, the local arrangements for the continuation program became the responsibility of the district health officers, who could call upon the central office for help not available within the district. This shifting responsibility simplified the organization and administration of the program.

Early in May lists were received identifying children who received vaccine and those who received placebo. These were distributed to school principals and to the district health officers. Principals were requested to forward the names of children who had transferred out of their schools to new schools.

From the number of parental requests received at the schools, it was possible to estimate the amount of vaccine and supplies necessary for each school and the number, time and date of doctor sessions required. Planning was somewhat upset by the delay in release of vaccine by the National Institutes of Health, and by a number of withdrawals of requests. These followed the finding of a few unsafe lots of vaccine from one manufacturer and necessitated a reappraisal of methods used in killing the virus.

Staff for this program consisted of the district staff of school physicians augmented by those recruited by central office from other bureaus. The district nursing staff was supplemented by the employment of several part-time public health nurses and by the use of the staff of public health assistants.

Publicity for the program was the responsibility of the district health educator who kept the local newspapers supplied with items on the value of the inoculations and the time and date they would be given in each school. Material for the city-wide newspapers was supplied by the department press representative at central office.

During the week just prior to and continuing each day during the week the inoculations were being given, a local radio station cooperated in the program by spot announcements prepared by the health educator giving current information on the time and schools at which the inoculations would be available in each neighborhood. This daily reminder proved to be a very useful device.

Through the offices of the district superintendents of the Board of Education, letters were sent to all school principals informing them of the scope of the program and their functions in it, and requesting their assistance in securing parental requests. This material was sent directly from central office, followed by a memorandum from the district health officer giving the exact details as to when the inoculations would be given at the school.

Volunteers

It was evident that the successful operation of this immunization program would depend to a considerable extent on the skillful recruitment, training and use of volunteers. Through the director of the local chapter of the National Foundation for Infantile Paralysis many capable women offered their services in the district inoculation program. Principals and parent-teacher groups also aided in securing mothers to assist nurses and doctors in their neighborhood schools. Approximately 250 women volunteered their services during the period the program was in operation.

In order that they might participate most effectively, orientation sessions were organized by the district supervising nurse for the volunteers. The program was explained and the functions of the volunteer were interpreted. Stress was laid on team work rather than on a job specifically designated for the volunteer. Procedures were demonstrated and explained. All volunteers had ample opportunity to ask questions and to review the actual procedure after the orientation. The dates for giving inoculations were announced so that each might plan her household activities in advance.

The duties of volunteers consisted in washing arms of children with alcohol, recording data on medical and teacher records and keeping statistical data for the local district office. Volunteers helped with the assembling of supplies for delivery to the schools from the district health center and with the transportation of them to and from the inoculation sessions. They also assisted with the washing of syringes and needles. Wherever possible, they sorted needles after cleaning and replaced them in cardboard needle holders. Syringes were rinsed, assembled according to number and tied with a rubber band. This helped tremendously at the district office where the packaging was done for sterilization. The contribution of the volunteers cannot be estimated in dollars and cents. Their work was a magnificent tribute to the successful operation of the polio immunization program.

Preparation of Sterile Supplies

Mass immunization programs require careful planning of details. Because group immunizations are scheduled miles from the central source of supply, consideration was given to the amount of equipment and supplies initially allotted on the basis of parental requests, plus an additional allotment for emergencies. Records were kept of the

Polio immunization clinic in a schoolroom. (Photograph by George Doherty, Department of Health, City of New York.)

amounts of alcohol, cotton, trays, and number of syringes and needles sent to each school; the amounts used served as a basis for subsequent allotments.

Provision had to be made for cleaning, packaging, and sterilization of supplies as they were returned from each school. This part of the program was assigned to volunteers, public health assistants, and part-time public health nurses. The latter supervised the packing and helped in having materials ready for distribution to the school clinics.

A large central room was set aside for washing syringes and packaging into special porous, self-sealing paper envelopes. Syringes were washed with Alconox, a detergent, rinsed in tepid water, then assembled on a table covered with a clean sheet to dry. Rubber bands were removed. As soon as they dried, the syringes were placed in envelopes and sealed. Needles which had been cleaned at the school were examined and placed in lots of twelve in cardboard needle holders. These were then placed in an envelope along with one 24 gauge 1-inch needle for withdrawing the vaccine from the vial. Needles were packaged separately and kept apart from the syringes.

The autoclaving unit in the Corona-Flushing Health District was very small. The cooperation of Queens General Hospital was obtained. Supplies were packed in steel drums and transported by volunteers to Queens General Hospital. These drums were heavy and it was necessary to have porters or orderlies at each point to lift the drums and place them in the care of the volunteer. On the basis of a list of volunteer women, the district supervising nurse prepared a schedule for picking up sterilized drums at Queens General Hospital and unsterile ones at the health center. The magnitude of this transportation job created such a hardship that eventually arrangements were made with the central office for such deliveries to be made by a department truck.

Each supervising nurse was responsible for seeing that schools under her jurisdiction had adequate supplies to meet their quotas. In case unexpected shortages or emergencies arose, two inspectors with cars were assigned to the district health center for emergency transportation of supplies and vaccine. Fortunately, due to the careful planning only rarely was their assistance required.

Nursing Service

During the periods scheduled for inoculations all school health activities were suspended. Wherever possible, public health nurses served in their regularly assigned schools. This arrangement was not possible in every instance as many of the nurses are ordinarily assigned to four or five schools. Every effort was made to consider travel time from home for these nurses assigned to other schools in the neighborhood.

As soon as the operating schedule for the program was established, the district health officer discussed it with the district supervising nurse. The overall plan was then discussed with the three supervising nurses who were made responsible for school clinics selected according to the geography and transportation facilities of the district. Staffing of the school clinics became the responsibility of all supervisors concerned. Modifications and adjustments were necessary, particularly if the regularly assigned nurse was scheduled for night duty in some other clinic service. Once the assignments were made, each public health nurse was alerted to make preparations and assemble her equipment and records. Prior to the clinic she was responsible for reorienting the volunteers in their respective tasks.

Inasmuch as staff education is vitally important for keeping nurses well informed, all newly appointed nurses were given special orientation lectures and were assisted in their local schools by their supervisors at the time of giving the inoculations. Through these devices, as new information or procedures

(Continued on page 30)

A nursing authority discusses the history, transmission, medicolegal aspects, symptoms and tests, treatment and nursing care of

Homologous Serum Hepatitis

by Amy Frances Brown, R.N.

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EXPERIMENTAL transmission of viral hepatitis to human volunteers has led to the identification of two varieties of viral hepatitis, *infectious hepatitis*, caused by virus A (also called IH virus), and *homologous serum hepatitis*, caused by virus B (also called SH virus). These two forms of infection are not readily differentiated by clinical features, but are differentiated by differences in incubation periods, by routes of dissemination, and by the specific immunity conferred by each virus. This article will deal with the subject of homologous serum hepatitis.[1] Homologous serum hepatitis is apparently identical with what has been called variously post-vaccinal jaundice or hepatitis, syringe hepatitis, and post-arsphenamine jaundice.

History: Although it was not known by that name, one of the first large outbreaks of homologous serum hepatitis occurred in 1883-84 among workers in a Bremen shipyard. The workers were vaccinated with human lymph derived from cases of vaccinia, and from one to seven months later, jaundice developed in 191 of 1,289 persons. This epidemic was reported by Hirsch and by Lurman.

The first detailed study of homologous serum hepatitis was made by Flaum, an interne at a hospital in Lund, Sweden, and his associates; and the report was made in 1925 in the Acta Medica Scandinavica. Their study was based upon an epidemic of jaundice which affected several patients and four technicians. Flaum recognized that the common element present in all cases was a spring lancet which the technicians used to collect blood for measuring fasting blood sugar levels. Flaum and his colleagues concluded from their study of the cases that the epidemic of jaundice was viral in origin, that it was transmitted by needle puncture, and that it had an incubation period of about ninety days. They predicted correctly that the epidemic would end in about ninety days if the patients' blood specimens were collected with disposable needles.

The first time the term "homologous serum jaundice" was used was in a memorandum published in 1943 by medical officers of the British Ministry of Health in which it was reported that jaundice had developed in recipients of pooled plasma or serum transfusions.

Hepatitis had long been recognized as a disease of armies, but there had not been established the evidence of its infectious nature which doctors suspected. Then, in 1942, there were reported among American troops sixty-two deaths and more than 28,000 cases. All cases received a vaccination of yellow fever, most of them ten to thirteen weeks previously. Research demonstrated the hepatitis factor in certain batches of human blood serum and yellow fever vaccine. This discovery led to the elimination of blood serum and the substitution of the egg yolk method of making the vaccine.

In another Army experience, the transmission of homologous serum hepatitis by blood was demonstrated by cases of hepatitis occurring after anti-tetanus injections.

Transmission. Evidence finally led to incrimination of the single-syringe-multiple-dose method of giving injections. This technique, while widely practiced in mass immunization methods, could never have been justified by anyone really informed on the correct method of giving injections. In giving an intramuscular or a subcutaneous injection, one should withdraw the plunger slightly to determine whether or not the needle is in a vein. This means that a small amount of either tissue fluid or blood is drawn into the syringe. While the drug may then be injected into that patient, it could not safely be administered to another individual.

It is now known that serum hepatitis may be transmitted by doctors, dentists, nurses, and technicians who use contaminated needles, syringes, or similar equipment. A sterilized pipette should be used for each withdrawal of blood from the lobe of an ear. Syringes and needles should be washed with soap and water, then sterilized by boiling or by autoclaving after each use. It is quite unsatisfactory to rinse the pipette, syringe, or other instruments with alcohol.

In a careful study[2] of 587 soldiers wounded in the Korean conflict, it was found that 21.9 per cent of those who received blood and plasma developed jaundice. Contrasted to this was an incidence of 3.6 per cent among those who received blood alone.

An outbreak of homologous serum hepatitis among patients in a general hospital was reported[3] in which the relation of the epidemic to a batch of human thrombin was shown both by epi-

Grateful acknowledgement is made for the bibliographic assistance of Mrs. Gladys Bartholow, Reference Librarian, Medical Library, State University of Iowa, Iowa City, Iowa.

[1] For a discussion of infectious hepatitis, see *American Journal of Nursing*, July, 1950: 429-41, "Viral Hepatitis", Amy Frances Brown. Reprinted in pages 506-15, *Medical Nursing*, ed. 2. Amy Frances Brown. W. B. Saunders Co., 1952.

[2] *Archives of Internal Medicine*, November, 1953, (Vol. 92); 678-83. Victor M. Sborov, *et al.*

[3] *Journal of American Medical Association*, September 5, 1953, (Vol. 153): 17-19. Joseph E. Porter, *et al.*

demiological investigation and by demonstration of the virus in the thrombin through studies on volunteers.

The SH virus is hardy. It can be stored for months in the dried state, is resistant to heating at 56 degrees centigrade in the dried state for thirty minutes, may remain alive three and a half years in the frozen state, and can be exposed for months to 0.5 per cent of an equal mixture of phenol and ether. The virus survives in serum containing merthiolate in a concentration of 1:2000. It can even withstand heat at 132.8 fahrenheit for an hour.

Pooled plasma is a potent source of serum hepatitis. The data are not convincing which are given to support claims that irradiation of plasma with ultraviolet light kills the virus in the plasma.

Allen *et al* have stated[1] that the stability of pooled citrated plasma is such that it may be stored in a liquid state at room temperature for at least three years and still retain clinical usefulness. They state that storage of pooled plasma in a liquid state for six months at room temperature eliminates the danger of transmitting virus B, provided that the selection of donors is in accordance with standards set by the National Institutes of Health. They state that if these standards are ignored, a longer period of storage is necessary.

But Davison, in a carefully documented article,[2] states that although storing the plasma may reduce the risk, it may also prolong the incubation period so that the serum hepatitis is overlooked. He reminds us that the chance of pyrogens is increased by the storage of liquid plasma.

It has been shown that 0.00004 cc. of infected serum can transmit virus B.[3] The hepatitis virus can cross the placental barrier.

Medicolegal aspects. By the middle of 1954, ninety-five cases had been reported of laboratory workers who had been infected with hepatitis virus B while at work. Anyone handling infected syringes and needles should be careful to avoid even slight pricks or scratches on the hands.

In at least one case a court has ruled that when accidentally or spontaneously acquired by medical and laboratory personnel, homologous serum hepatitis is compensable under workmen's compensation laws.[4]

From the medicolegal aspect, operative permits should include permission for blood and/or plasma transfusions. Transfusions in surgery, unless absolutely necessary, may carry more risk than many kinds of operations.

Blood donors. It is recommended by the World Health Organization Expert Committee on Hepatitis that no person be accepted as a blood donor if he has had jaundice at any time during his life. The Committee would make an exception for a single transfusion as a life-saving measure.

It is recognized, of course, that a person may have had *hepatitis sine icterus* and that there is no laboratory test which can be used satisfactorily to determine whether an individual has had hepatitis in the past. The risk is about one per cent of hepatitis being transmitted by a donor who does not give a history of hepatitis. The risk is increased in direct proportion with the number of donors used in pooled plasma. The armed services are no longer using pooled plasma.

Symptoms. In a study of the soldiers wounded in the Korean conflict[5] the mean incubation period of homologous serum hepatitis was found to be 90.3 +— 11.7 days. Since it attacks an organ of diverse functions, hepatitis is a disease of varied symptoms. The most typical symptoms involve the digestive system: nausea, vomiting, diarrhea, pain in the abdomen, and such anorexia that anything reminding the patient of food may be quite upsetting to him. If the patient remains ambulatory, he may have right-sided abdominal pain and cramps from an enlarging liver.

Darkening of the urine usually attracts the attention of the patient and antedates frank jaundice. The bile production of the liver is so disturbed that the bile pigments back up into the blood stream to the point that the skin and the whites of the eyes are tinged a mustard yellow. This jaundice is accompanied by extreme itching of the skin. Thus, the patient may scratch until his arms, legs, and trunk are covered with raw sores. The stools become lighter in color, but it is unusual to have completely clay-colored stools. There is no correlation between the severity of the hepatitis and the intensity of the jaundice.

Jaundice continues to increase, usually for three to seven days. At this time, what may be called "the crisis" appears; the serum bilirubin begins to recede, bile begins to appear in the stool, and the symptoms abate abruptly. After the crisis, the jaundice gradually subsides in a period of one to three weeks or longer.

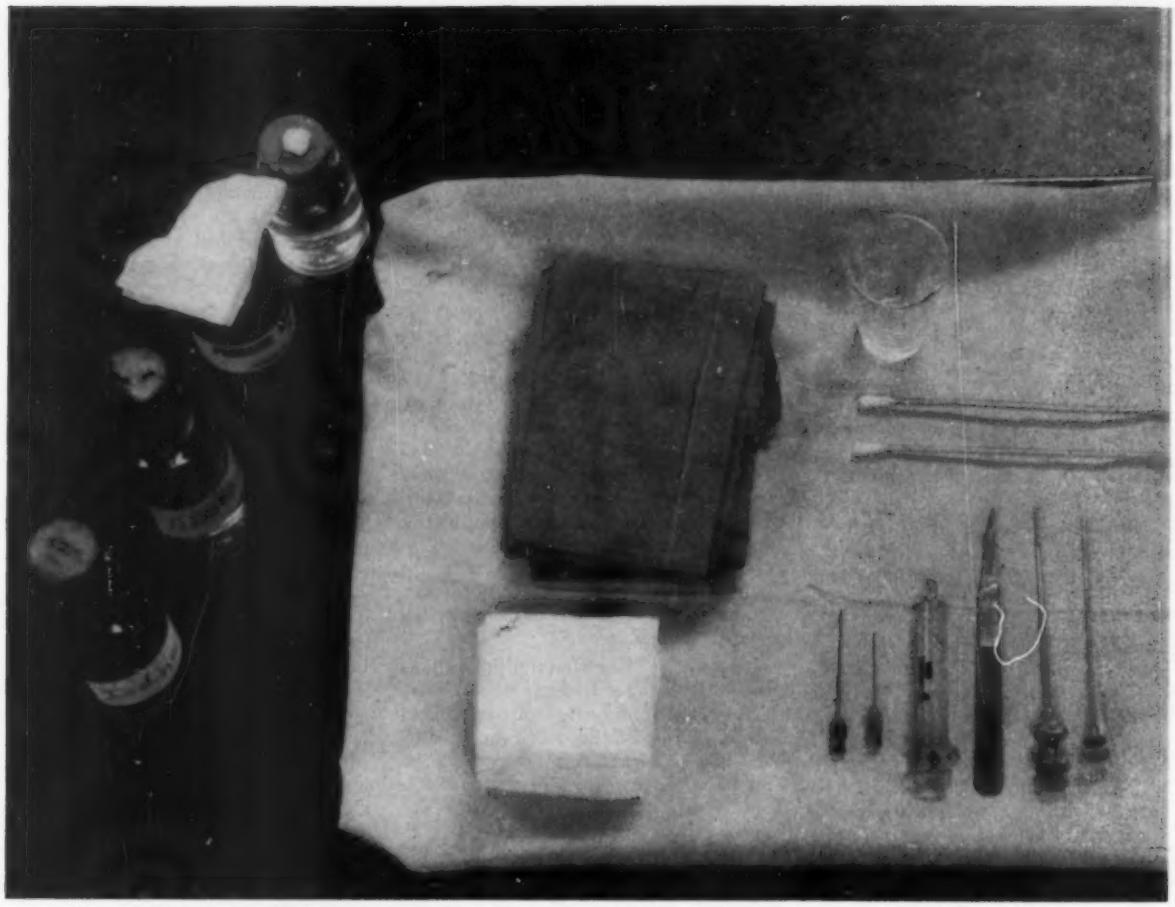
When jaundice disappears, the patient is said to be in the convalescent stage. The disappearance of jaundice does not necessarily indicate recovery. Relapse usually occurs if the patient is allowed out of bed immediately after the serum bilirubin reaches normal. Getting the patient out of bed too soon frequently results in recurrence of jaundice; and in some cases the relapse may be more severe than the original attack. The convalescent stage may last two to three weeks.

Nurses should be aware of the symptomatology of hepatic coma, since it is a condition from which there is seldom a return. Usually one of the first symptoms to be noted is mental confusion, usually insidious, but sometimes abrupt. The patient may wander about the ward, pick at his bed clothing, or show other inappropriate behavior. At times, hypomania may occur. These symptoms may continue for several days before the patient lapses into coma. The confusion usually deepens as the drowsiness increases. An early disorder of the motor system emphasized by Adams and Foley is a flapping tremor of the outstretched hands in a rapid and arrhythmic manner. Another common finding is slow and difficult speech. Convulsions, either focal or generalized, may occur early in the course of the disease.

Jones has pointed out[6] the factors which precipitate hepatic coma: (1) continued exposure to a hepatoxic agent in the presence of liver damage, (2) inadequate nutrition during the immediate period of hepatic injury and attempted repair, (3) inadequate control of metabolic requirements, and (4) improper use of sedatives, narcotics, and other drugs for a patient with liver damage. Chronic coma may be precipitated by (1) fatigue, (2) metabolic demands in excess of the capacity of the liver to do metabolic work, (3) intercurrent infection, (4) the use of noxious agents, (5) the use of excessive amounts of protein or nitrogenous material in patients with a very narrow margin of safety, (6) failure to take an adequate diet over appreciable periods of time, (7) major hemorrhage, and (8) trauma or surgery. Because opiates and certain of the barbiturates are "detoxified" or conjugated by the liver, even ordinary doses are not well tolerated in the presence of hepatic insufficiency. Thus, an ordinary dose may have the effect of overdosage with resulting coma.

The fact that there is no satisfactory treatment for hepatic coma is indicated

[1] *Ibid*, January 9, 1954, (Vol. 154): 103-07. J. Garrott Allen *et al.*
[2] *Journal of Pediatrics*, June, 1955, (Vol. 46): 717-23, W. B. Davison.
[3] *Ibid*, June, 1955. (Vol. 46): 717-23, W. C. Davison.
[4] *Ibid*, November, 1954: 606-16. Phillip M. Stimson.
[5] *Archives of Internal Medicine*, November, 1953, (Vol. 92): *op cit.*
[6] *Journal of American Medical Association*, May 14, 1955, (Vol. 158): 119.



Liver biopsy is used to determine the diagnosis in hepatitis, cirrhosis, obstructive jaundice, malignancy, leukemia filtration, and other liver conditions. On this tray is equipment for the procedure, with exception of sterile rubber gloves.

The Silverman needle is one of the types of needle used for liver biopsy.

by the variety of kinds of treatment still being proposed. The factors which remain most important in treatment are close attention to the details of fluid and electrolyte balance, avoidance of infection, care of anemia, supportive therapy as indicated, and general nursing care.

Liver insufficiency can be predicted on the basis of careful observations. In a patient known to have liver disease, any of the following should be looked upon as indications of liver failure: increasing jaundice, increasing abdominal distention, peripheral edema, the appearance of fresh spider angiomas,[1] the gradual development of muscular twitching, and fetor hepaticus. An abrupt or steady drop in urinary output should be reported, as oliguria is always a bad sign in disease of the liver.

Fetor hepaticus is a peculiar odor which can be detected on the breath of certain patients with liver injury. As one comes close to a patient who is exhaling through his mouth, one may note an odor somewhat sharp and pungent; but as one draws away, the breath odor is sweet and somewhat fruity. It was formerly thought that the presence of fetor hepaticus was an ominous sign of impending death. Recent studies indicate that this is not necessarily true. The odor is almost always present in patients who are in hepatic coma.

Diagnostic tests. The tests of liver dysfunction of value and widely used in diagnosis are the cephalin-cholesterol flocculation test, the thymol turbidity test, and the bromsulfalein dye test. In the latter test, 5 mg. of bromsulfalein is injected into a vein in the arm at about 8 A.M., after the patient has fasted since midnight. Forty-five minutes later, 5 cc. blood is withdrawn from a vein in the other arm. Fasting is not necessary for the withdrawal of the 4 to 5 cc. of venous blood drawn for the other two tests or for the icteric index or van den Bergh test.

The bromsulfalein test is a test of the function of the parenchymal cells

[1] Shown in color on page 517, Brown, Amy Frances: *Medical Nursing*, ed. 2, W. B. Saunders Co., 1952.

the liver. A retention of 10 to 15 per cent or over indicates liver damage. Following a bout with homologous serum hepatitis, the retention should be stabilized around 5 per cent or below before the patient is permitted out of bed.

The normal for total proteins in the blood is 6.2 to 7.5 Gm. per 100 cc., and for serum albumin is 4.0 to 5.5 Gm. In viral hepatitis, there is a possibility of a low concentration of serum albumin, including a reversed albumin-globulin ratio. This would indicate defective synthesis in the liver and a tendency to edema, even ascites if there is appreciable portal obstruction. Until a normal figure is reached, the physician may prescribe one or two units of serum albumin intravenously daily. This can be given without fear of reaction.

Treatment and Nursing Care. The three cardinal measures in the treatment of acute hepatitis are bed rest, proper diet, and avoidance of factors which would be injurious to the liver. Bed rest for at least two to three weeks is the most important single therapeutic measure. This includes restriction of visitors. There is some evidence that just a change to the erect position increases the demands upon the liver.

In the presence of liver damage, there is an increased tendency to retain sodium. For this reason, moderate restriction of salt is advised. During the prodromal and icteric stages, the patient should have 4000-4500 cc. fluid daily.

An excess of fat other than butter fat may be poorly tolerated, causing nausea and anorexia. There may be intolerance to fats for as long as four to six months. However, fats have not been demonstrated to cause any harm to patients with hepatitis who tolerate them well.

Because of the anorexia, considerable imagination is needed by the person who plans the meals. Six small meals are to be preferred, since it is most discouraging to a patient with anorexia to be faced with a large meal, no matter how well prepared. What may appeal to the patient for three or four days may be most distasteful to him the next day. Even the patient's favorite foods may lose their appeal. There should be catering to all the dietary whims, regardless of the inconvenience this may cause the dietitian or the nurse. The nurse should record the quantity of each food consumed by the patient.

The depression which sometimes accompanies homologous serum hepatitis requires imaginative care. The patient should be kept so interested in quiet diversions that he does not have time to be depressed.

During what is frequently a protracted period of convalescence while the return of strength and energy is discouragingly slow, the patient will appreciate the quiet encouragement of a sincere nurse and the inner strength which comes from spiritual convictions. Nursing care cannot be considered total nursing care unless the nurse is cognizant of the spiritual needs of the patient, as well as his physical, emotional, and social needs.

A liver which is already damaged is particularly liable to toxic agents which ordinarily would have little effect. This is especially important during the pre-icteric and icteric stages. This explains the importance of avoiding alcohol in any form, and exposure to hepatoxic anesthetics, opiates, short-acting barbiturates, and laxatives.

The time of contagiousness of hepatitis due to SH virus is believed to extend back at least sixty days before the appearance of jaundice, and perhaps even over the entire incubation period.

The liver is the main storage depot for vitamin A, the precursor of the visual purple of the red cells of the retina, responsible for vision in dim light. Defects in night vision sometimes occur during a severe attack of acute hepatitis. As a precautionary measure, therefore, night driving would seem inadvisable until tests or inquiries have demonstrated that an individual recently recovered from hepatitis is not endangering himself and others.

Chronic hepatitis. Chronic active hepatitis is characterized by intermittent periods of disability for months or years. Even in well treated cases, this occurs in 5 to 10 per cent of cases. Cirrhosis of the liver occurs in a relatively small number of cases.

Mortality. In adults, the mortality of virus hepatitis of either type (IH or SH), may be 5 to 16 per cent. It is usually much less in children. Most deaths occur in the second week of clinical manifestations.

Hepatitis in Children. In children, hepatitis of either IH or SH type is likely to be much milder than in adults. The onset of the disease is accompanied by more vomiting but with less anorexia and less often with fever. The jaundice, if present, is usually shorter in duration. There is less danger in early ambulation.

Research. It would seem remiss to close an article on hepatitis without a word of appreciation to the individuals who, through their own contributions, have forwarded the research on this important disease. No laboratory animal has been shown to be susceptible to either IH virus or SH virus. Research, therefore, has been carried on during epidemics which have occurred or by the contributions of human volunteers, such as conscientious objectors to armed service. The latter involves, not only the danger of serious illness, but even the danger of death.

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A teacher who sought information and advice for herself shares the answers she found to

Twenty-Five Questions on Colostomy Management

by Lester Breidenbach, M.D.

Director of Surgery at Beth David Hospital, New York City, and Associate Professor of Clinical Surgery, New York University

and Sophia M. Secor

Dr. Breidenbach: I have long realized the great need of the colostomy patient for help and practical guidance in proper management of colostomies and have followed through a series of experiences with one of my colostomy patients. We have arrived at certain conclusions which I believe will be of definite help to all colostomy patients. My patient will tell her own story.

Mrs. Secor: I have been a colostomy patient since December 1946. For twenty years before that I was ill with ulcerative colitis. When malignancy set in, I had to have an abdomino-perineal resection. This extensive surgery was followed by months of suffering and agony. There was no other colostomy patient with whom I could discuss my problems. My surgeon told me that I was never to wear a bag, and that I was to irrigate the colostomy once in forty-eight hours. I was bewildered by these instructions and when I attempted to carry them out, I found that fright together with my meager knowledge about the whole situation made it impossible for me to prevent spillage between irrigations. I knew rehabilitation would be incomplete unless I could learn how to do this procedure. But how? I could not find the answer.

My surgeon was always kind and encouraging, for which I shall always be greatful. But I knew now, since he had never had a colostomy himself, that he could not know the answers to all the problems that faced me.

I am a Junior High School teacher of music. This is a strenuous job in a school of 2,000 adolescent pupils who study music twice a week. Besides, I have to handle four orchestras and a class of musically-gifted children. I could not afford to be ill at school. I had to attend afternoon meetings and to arrange for evening performances. My colostomy had to be kept out of the picture, since no one at school had the faintest knowledge of my condition.

The job before me was tremendous. I found out later that I had not even recognized the salient problems in the early days of my difficult adjustment. Rehabilitation of the colostomy patient, however, can be accomplished by following through a definite, accurate program.

I was determined to conquer my handicap. I had so little knowledge about colostomy management that I was constantly in fear of an accident. The literature on colostomies at the Academy of Medicine was incomplete. Conflicting points of view confused me even more.

I decided to try the trial and error method by self-experimentation. I tried every size catheter. I tried holding the irrigating can at different levels of height. I tried various solutions in the water. I tried varying temperatures. I tried inserting the catheter two, four and six inches and finally all the way into the colostomy. I used from a pint to nine quarts of water. I tried various diets. I tried irrigating at different times of the day. All of these experiments had disastrous results when they were unsuccessful. But I watched each result carefully. It took five years for me to learn that my colon is treacherous and unpredictable only if I do the wrong things. I learned gradually that there was a consistent reaction if I used a certain size catheter, or if I held the can at a certain level.

After I came upon what I believed to be the right answers, I discussed them with my surgeon, Dr. Lester Breidenbach. He followed through with me on all of my difficult problems and approved each of my successful experiments. By working together for several years, we have found that there is a workable norm in all cases, with only slight variation for individual differences. Following the establishment of a workable norm, Dr. Breidenbach allowed me to take care of his colostomy patients. I was permitted to go into the hospital to give a series of talks. After I wrote several articles on the subject, I began hearing from patients, surgeons and nurses from all over the United States. I learned that the lack of knowledge on proper colostomy management was appalling. Most of the patients whom I talked with were wearing bags or pouches because they knew of no other way to take care of themselves. The need for help was urgent.

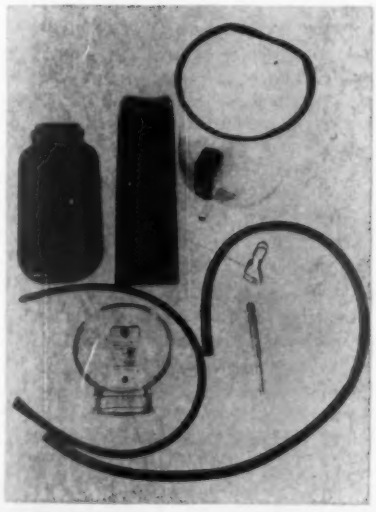
In my association with 200 patients and through discussions in eighteen hospitals in the East, I have learned that certain common errors prevent complete rehabilitation of the colostomy patient. For this work I took time out from school on a Sabbatical leave. Since then I have been working with colostomy patients after school hours, and on Saturdays and Sundays.

These are the most important questions I have had to try to answer by self-experimentation:

1. Should a patient be told the nature of the surgery without necessarily mentioning the word "cancer?"

Most patients are not even told about their colostomy until they are almost ready to leave the hospital. The patient is shocked at a time when he has already gone through the shock of extensive surgery. Rehabilitation is delayed because of it. I believe that doctors and nurses who get their patients prepared spiritually for the operation are doing a great service. Most of the patients whom I have talked with have said that they wanted to be told. A gentle approach with a convincing talk on the need of the operation as a life saving measure, and assurance on its successful handling later, may be all that is necessary. One need not mention the word "cancer." The layman's conception of the word "cancer" is that it means something sinister and hopeless. The normal activities the patient with a colostomy would be permitted to engage in could be mentioned when he leaves the hospital. It is essential that the correct instructions for proper handling of the colostomy be made available to the patient.

2. Can a patient go for a period of



LEFT: A bathing bag of this kind will hold all necessary irrigating equipment; it is useful for traveling. MIDDLE, LEFT: Irrigating equipment unassembled—a 2-quart irrigating can, a 24 F catheter, 28 inches of rectal tubing, a metal clamp, a glass connector, and an irrigating cup with opening large enough to admit the 24 F catheter, rubber (or plastic) tubing the bottom of which goes into the toilet bowl, rubber (or plastic) tube closed at the bottom to collect any water that remains after irrigation. MIDDLE, RIGHT: Irrigating equipment assembled. BOTTOM, LEFT: Dressing. A 2 x 4 gauze pad may be cotton lined; kleenex may also be used. Wax paper large enough to line the supporter; for a female patient, the supporter bottom is removed and garters are attached; the bottom can support a dressing immediately after surgery. BOTTOM, RIGHT: Patient irrigating. Particularly important is the position of the irrigating can—below shoulder level.

forty-eight hours with freedom from spillage between irrigations?

With specific and accurate instructions this can and must be accomplished. Otherwise the patient cannot be considered rehabilitated. No patient can go back to work as usual if he must constantly be afraid of possible spillage.

3. When should instructions be started?

These instructions should begin about ten days after surgery. The patient needs to be told that proper irrigating methods will keep the colostomy as clean as any other part of his body.

4. Should the patient be permitted to wear a colostomy pouch or bag?

This decision is, of course, made by the patient's physician. However, many patients are sent out with a colostomy pouch or bag with no further instructions than to empty the bag when it is filled. Every surgical house in the country carries these bags. Many doctors in the United States use them exclusively. Yet anyone who has a colostomy knows that the wearing of a bag spells doom and failure. It is a definite step toward isolation and separation from the rest of the world. The wearing of a bag is a blow to the morale of the patient. It is depressing, degrading, abnormal and odorous, not to mention the possibilities of hernia and figure distortion. Such practice may cause the patient to live more and more within the confines of his colostomy. He may brood over the situation until he has become antisocial and until he has given up the idea of returning to work as normal a human being as possible. And so this individual, who should have been given accurate instructions on how to live with his colostomy, is lost to the outside world. Visible amputees are treated with sympathy and understanding and with proper braces and aids for their disability. A colostomy case is an invisible amputee. He becomes a mental case to the rest of the world, since there seems to be no definite reason for the strange, elusive behavior of the colostomy patient who wears a bag.

5. How high should the irrigating can be held?

One of the most common errors in giving instructions is to use indefinite terms. Be sure to avoid such statements as these:

"Have the water enter slowly."

"Hang the irrigating can somewhere in the bathroom."

"Keep the irrigating can 18-24 inches above the colostomy."

"Keep the can at eye level."

"Hang the can as high as a normal person would do for an ordinary enema."

The patient should be told that the height of the irrigating can is the most

important feature of a successful irrigation. The bottom of the can should be about 4½ inches below shoulder level and parallel with his body. This may vary about ½ inch either way, allowing for individual differences. This arrangement keeps the can only about six inches above the colostomy.

6. How does the irrigating procedure work?

I found that a 24 F catheter inserted all the way into the colostomy worked best in my case. The irrigating can was arranged so that the bottom of it was 4½ inches below shoulder level. With the can held this low, the pressure of the water was also kept low. As the water was allowed to rise into the colon, the low pressure of the water filled up only the left colon. About a quart or a quart and a half of water went into the left colon before the first cramp was felt. This took from twelve to fifteen minutes under normal circumstances. The catheter was removed after the first heavy cramp, which was a sign that mass movement had begun. It is a mistaken idea that the colon will empty itself if the can is held higher. The water may enter more quickly, but the pressure will cause it to rise into the transverse colon.

Here is where the trouble begins. The water will get lost in the transverse colon, and it will not return. Some of the water may be absorbed, but most of it will come back in spurts anywhere from 12 to 20 hours after the irrigation. The patient will then think he has diarrhea, but actually it is the water that has remained in the colon after the previous irrigation. This can be a great handicap to a colostomy patient who has lost control of his sphincter muscle. This method, used widely, of holding the can 18-24 inches above the colostomy, will retard rehabilitation. As a matter of fact, unless this method is changed, the patient may become permanently disabled. He will never know when he may have an accident or spillage. With my method, the emptying of the colon is more like a normal emptying except that it will take about 30 minutes. There will be a cramp, a mass movement wave, an emptying, and then a pause of several minutes. The cramps will increase in intensity until the colon is emptied. At this time there will be no cramps at all. All the fecal matter and water will have left the colon by this time. It will take about 48 hours for the colon to refill.

7. Should patients be told that the sphincter muscle will grow back later?

Some patients are told that the sphincter muscle will grow back later and that the colon will function normally again. Such misrepresentation of facts causes a patient to lose faith and confidence in his doctor and will only put off the problem he must eventually face.

8. Should patients be told that their colostomies will work without irrigations?

It is a mistake to tell a patient that his colostomy will work without irrigations. This method has been tried over and over without success, because the normal process of digestion sends the fecal matter through the colon in the slow mass movements that finally reach the sigmoid (which has been removed in the colostomy patient). This natural process will not change for a patient whose rectum has been removed. Occasionally a larger mass movement will cause a discharge, but this does not slow up the action of the colon for a planned period of time as the irrigation will do. The fecal matter will keep moving unless an area that takes 48 hours to refill is thoroughly cleansed by means of the irrigation.

9. How far should the catheter be inserted?

Patients are generally told to insert the catheter about 4-6 inches into the colon. This method was not satisfactory for me; it was necessary for me to insert the entire length of the catheter. Pressure had to be built up by water to get behind the solid fecal matter. The catheter must reach the upper part of the colon for proper emptying. Some doctors are afraid of perforation if the catheter is put in this far. The patient can feel where the catheter is going, especially if it hits a dead end. Besides, perforation can occur even in the first inch of the colon if the patient is careless in his use of the catheter.

10. What is the best size catheter to use?

I find the 24 F catheter sufficiently wide enough to hug the colon wall, and thus keep the water in the colostomy when it is inserted all the way. The water will not seep out at the sides; it will be retained to build up the pressure necessary for proper emptying of the colon.

11. Is it wise for the colostomy patient to become constipated?

Many patients have the impression that it is better for them to be constipated. I have found this to be a serious mistake. If the patient is constipated, the force of the water sent into the colon during the irrigation will be insufficient to empty it. Furthermore, the inactivity of the colon, as a result of the constipating diet, may even cause the water to remain in the colon. Nothing can be done about this. The colon can just refuse to act. Then the behavior of the colon for the next forty-eight hours after the irrigation will be unpredictable. The water may seep out at the sides all the next day, or several small movements may occur before the next irrigation. This will cause the patient to feel uncomfortable and apprehensive. Of course, it is not good for a patient to go on a diet that causes diarrhea either. He should be told instead to maintain a balance between constipation and diarrhea. From my experience, I have found that it is best to start with a low residue diet after leaving the hospital and then add a new food such as raw fruits or vegetables on alternate days. If the patient was able to tolerate such food before the operation, he will usually be able to take it again. The fecal matter should have the consistency of tooth paste. The diet should be planned with this clue in mind.

12. What can be done if the patient has diarrhea?

In case of diarrhea, I found it helpful to insert a kleenex twisted tightly so that it protruded about two inches. When it was inserted into the colostomy, the moisture was absorbed by the kleenex and movements stopped. When the kleenex got wet, I changed it for a dry one. When diarrhea persisted, my doctor prescribed a teaspoon of milk of bismuth every four hours. If this did not produce results, he allowed me to take 10 drops of deodorized tincture of opium. I was advised to use this sparingly for effective results, because ten drops will stop all colon activity within an hour.

13. How can a patient avoid the escape of gas from the colostomy?

The formation of gas is due either to improper emptying of the colostomy or the intake of gas-forming foods such as onions, cabbage, baked beans, spices and nuts. These, of course, should be avoided.

14. What sort of support, if any, should the patient wear?

A two-way stretch or a supporter is better than having no support at all.

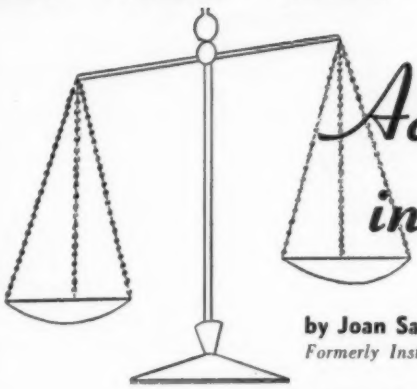
15. What is the value of having a colostomy patient see another patient who has a colostomy?

In my opinion, it is wise for the patient to see another patient who has successfully handled his colostomy and who can give information during the first few months after the operation. I have found this to be a great morale builder for the patient who is suddenly faced with a new kind of life.

16. What sort of dressing should be worn over the colostomy?

One of the least expensive and yet the most sanitary dressing that can be worn is a piece of kleenex over the colostomy. A drop of albolene will prevent sticking of the kleenex. A gauze dressing 4 x 4 may also be worn. This

(Continued on page 25)



Advances and Trends in Drug Therapy

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Drug Therapy in Urinary Tract Infections

With the introduction of a host of new chemotherapeutic and antibiotic agents for medical use, the past decade has seen a tremendous change in the therapy of infections of the urinary tract. In this issue of *Nursing World*, the role of the chemotherapeutic agents will be considered. In the next issue, the important contribution of the antibiotic agents will be reviewed.

Infection is the most common disease condition of the urinary tract. These infections can be considered in two classes, *acute* and *chronic*. The former class includes acute pyelonephritis, cystitis, prostatitis, and vesiculitis. Of these pyelonephritis and cystitis are most common. Frequent, urgent, painful urination, chills, fever, lumbar pain, and gross hematuria are the usual symptoms.

Chronic infections include chronic pyelonephritis, infected hydronephrosis, chronic cystitis, prostatovesiculitis, and urethritis. Infection is rarely confined to the bladder more than a few days and soon extends to the kidneys. For this reason, pyelitis is obsolete as a disease entity since renal tubules are invaded and pyelonephritis occurs.

Both chronic and acute infections may be caused by a variety of pathogens. Although the infection may be caused by a single organism, in many instances it is a mixed infection, e.g., an infection caused by two or more organisms. Although a review of clinical studies made in the past decade does not show complete agreement as to the order of predominance of the infecting organisms, all studies do indicate that the Escherichia coli is the pathogen most commonly found in the urinary tract. Classifying the pathogens according to their Gram stain, it is estimated that between 70 and 90 per cent of these pathogens are Gram negative bacilli, the remainder Gram positive cocci. Following is a list of the organisms commonly found in infections of the urinary tract:

ORGANISM	PERTINENT FACTS
GRAM NEGATIVE BACILLI	
Escherichia coli	Most commonly seen and most commonly inhibited. Accounts for approximately 90 per cent of pyelonephritis and 50 per cent of cystitis.
Aerobacter aerogenes	An important secondary invader.
Proteus vulgaris and Pseudomonas aeruginosa	Some authorities believe these never occur spontaneousyl in urinary tract infections but are contaminants. Frequently found in patients who have calculi and patients with drainage tubes.
Salmonella	Seen rarely.
Shigella	Seen rarely.
GRAM POSITIVE BACILLI	Seldom present.
Diphtheroids	Found in mixed infections; non-pathogenic.
GRAM POSITIVE COCCI	
Streptococcus fecalis	Most frequently present of this group. An enterococcus, common inhabitant of the large bowel. Common pathogen in paraplegic patients. Difficult to treat. Frequently in mixed infections.
Staphylococcus aureus	Second most positive of gram positive cocci.
Staphylococcus albus	Probably non-pathogenic. Frequently present when E. coli is the infecting organism.
Staphylococcus citreus	Probably non-pathogenic.
Hemolytic streptococcus	Rarely seen.
Streptococcus viridans	Rarely seen.

These pathogens or non-pathogens gain entry into the urinary tract by way of the urethra (particularly in the female), or by way of the blood stream, and more rarely by direct extension from an inflammatory process in a neighboring organ. The "ascending route," with initial invasion of the lower urinary tract through fecal contamination, is at present believed to be the most common route of infection. This latter theory is substantiated by the fact that E. coli is the most common infecting organism and secondly that the reported incidence of pyelonephritis is higher in females than in males.

Stagnation of the urinary flow resulting from prostatic hypertrophy, pregnancy, or urinary calculi is the most common precipitating factor. Other predisposing factors include obstetric anomalies, foreign bodies, and tumors.

Occasionally the infecting organisms reach the urinary tract by means of the general circulation. Foci of infection of the upper respiratory tract, sinuses, tonsils and adenoids, provide sources for the hematogenous spread of bacteria.

Quite obviously, the selection of the proper chemotherapeutic or antibiotic agent for treatment of the infection

depends on the early recognition of the infecting microorganism.

Second in importance only to an accurate history, then, is the examination of the urine. For accuracy in determining the infecting organism, catheterized specimens in both male and female are preferred; in the female, many authorities feel a voided specimen is of no value since contaminants may be present to distort the picture. An initial determination of the degree of acidity or alkalinity of the urine (the pH) will not only provide information about the organism, but will also affect the subsequent selection of drug therapy.

The wet, centrifuged specimen is examined for the presence of red and white blood cells, as well as bacteria, which, if present, should be checked for motility. The sediment is then dried and stained by the simple Gram stain. This will yield further information on which to base therapy.

In the meantime, cultures of urine may be obtained for further and more exact differentiation of bacterial strains. Techniques for identification are classic. They are based upon colony forms of organisms on eosin methylene blue and blood agar plates, their ability to ferment lactose or dextrose with or without acid and gas production, ability to hydrolyze urea, liquefy gelatin, and produce pigment.

One of the most effective aids of selecting an antibacterial agent is by performance of sensitivity tests. This information is obtained by inoculating the urine, exudate, or cultures onto mediums containing the various antibodies in a concentration like that ordinarily found in the serum or tissues following the ingestion of standard dosage of the various drugs. The zone of growth inhibition observed surrounding the disc indicates the degree of susceptibility or resistance of the organism to the body.

A survey of drug therapy in urinary tract infections indicates the agents commonly utilized.

The role played by methenamine in the treatment of infections of the urinary tract is essentially of historical interest today. Methenamine, or urotropin, was considered at one time an important therapeutic agent, but it has largely been replaced by antibiotics, sulfonamides, and mandelic acid. In urine with an acid pH, the drug liberates formaldehyde. The latter supposedly exerts bactericidal activity against E. coli. Coccal infections respond less satisfactorily. Methenamine is also of value as a prophylactic when it is administered before urinary tract instrumentation or surgery. It has also been used in typhoid fever as a prophylactic against bacilluria. It is of special value in patients suffering from renal insufficiency because the drug is nontoxic even if excretion is delayed. It also has a special usefulness in refractory urinary tract infections in which the administration of methenamine is alternated with that of other drugs to prevent the development of bacterial resistance to any one specific agent.

Prior to the introduction of mandelic acid into therapy, it was known that a highly acid urine was bactericidal. Those bacteria producing a strongly alkaline urine were treated by efforts at acidification of urine. The clinical procedure employed to lower the pH of the urine was to administer acid-forming salts or to prescribe a ketogenic diet. The rather unpalatable diet ensures excretion of beta-hydroxy-butyric acid. Rosenheim (1935) undertook a study of a number of related keto and hydroxy acids and observed that mandelic acid, after oral administration, was excreted as such in the urine and that it was bactericidal in an acid medium. This marked the introduction of the drug into clinical medicine for use in urinary tract infections. To be effective, the drug must be given in amounts sufficient to produce a concentration in the urine of 0.5 per cent and the pH of the urine must be 5.5 or less. Ammonium chloride may be necessary to bring the hydrion concentration to the effective range.

Mandelic acid is germicidal for E. coli, Aerobacter aerogenes, Pseudomonas, Alcaligenes, Salmonella, and Shigella. Streptococcus fecalis and staphylococcic infections are more resistant to the agent. Cure of paratyphoid infections has also been reported. Infections caused by organisms which split urea to ammonia, for example, certain strains of Proteus and Pseudomonas, do not respond to mandelic acid because it is not possible to make the urine sufficiently acid in the presence of the ammonia.

The primary contraindication to the use of mandelic acid is impaired renal function. If the drug is not efficiently excreted, severe acidosis and renal damage may result. Methenamine mandelate or mandelamine is a chemical combination of mandelic acid and methenamine. Its bacterial spectrum in urine is similar to that of sulfonamides and streptomycin provided that an acid medium is maintained. Susceptible organisms include E. coli, S. aureus, S. albus, and certain streptococci. Aerobacter aerogenes and Proteus vulgaris are usually resistant.

The sulfonamides, introduced in the 1930's, revolutionized the treatment of urinary infections. It is difficult to determine which member of this class of drugs is the most effective, and no useful purpose would be served by presentation of the controversial literature.

Sulfonamides are most effective against urinary tract infections caused by E. coli, A. aerogenes, Salmonella, Shigella, H. influenzae, and Staphylococcus. They are less effective against Proteus vulgaris and Pseudomonas aeruginosa. The latter are frequently refractory to other drugs as well. Sulfonamides are generally ineffective against group D hemolytic streptococci, Streptococcus fecalis, non-hemolytic, green, and hemolytic enterococci. Sulfonamides are not only bacteriostatic but may actually attain bactericidal concentrations in the urine. There is some clinical and experimental evidence that the antibacterial action of sulfonamides is enhanced in an alkaline urine. The administration of alkaline salts to prevent crystalluria serves a dual purpose.

Nitrofurantoin, or furadantin, is a derivative of the organic compound furan. These drugs possess antibacterial activity and furadantin has a broad antibacterial spectrum that encompasses both gram-positive and gram-negative organisms. Concentrations of the drug which are readily achieved in the urine are bactericidal to most strains of E. coli, M. pyogenes albus and aureus, S. pyogenes, and A. aerogenes. More resistant organisms include Proteus species, Pseudomonas aeruginosa, and A. fecalis.

Pyridium, an azo dye, was introduced as a urinary antiseptic. Like the other chemotherapeutic agents, it is given orally. Although the compound is active *in vitro*, when ingested it imparts little bactericidal activity to the urine.

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METHENAMINE — URINARY ANTISEPTIC

DESCRIPTION: Methenamine is a condensation product of formaldehyde and ammonia. Chemically it is known as hexylmethylenamine.

ACTION AND EFFECTS: Methenamine is absorbed as such from the intestinal tract. It circulates unchanged in all the body fluids and is rapidly excreted in the urine. If the urine is acid, formaldehyde is released as a result of the following reaction:

Methenamine	+	Water	→	Ammonia	+	Formaldehyde
$N_4(CH_2)_6$	+	H_2O	→	$4NH_3$	+	6HCHO

That methenamine releases formaldehyde only in an acid medium was demonstrated independently by Hinman, and by Hanzlik and Collins, in 1913. It is probable that the bactericidal activity of formaldehyde in the urine has been overestimated. This is a highly controversial point. Evidence has been presented that in concentrations even as high as 1:300 formaldehyde is only bacteriostatic and not bactericidal, even after exposure of organisms for several hours. Effective dosages of the drug usually produce a concentration of formaldehyde in the urine of only 1:5000.

USES: Methenamine was formerly one of the best urinary antiseptics available. Today it has largely been replaced by antibiotics, sulfonamides, and mandelic acid. It is of special value in patients suffering from renal insufficiency because the drug is nontoxic even if excretion is delayed. It also has a special usefulness in refractory urinary tract infections in which the administration of methenamine is alternated with that of other urinary antiseptics, to prevent the development of bacterial resistance to any one specific agent. E. coli infections respond satisfactorily to therapy with this drug. Coccal infections respond less satisfactorily. Methenamine is also used in typhoid fever as a prophylactic against bacilluria.

PREPARATIONS: Methenamine (Hexamethylenamine, Hexamethylenetetramine), U.S.P., is a white powder sold under various trade names. It is marketed as urotropin, formin, custamin, cystogen, urisol, uritone, aminoformaldehyde. Methenamine in tablet form is also available.

DOSAGE AND ADMINISTRATION: The effective dose is usually 4 to 5 grams daily. Excretion is rapid, so the drug is administered in four equal doses to obtain a fairly constant concentration in the urine. An acid-forming salt such as sodium acid phosphate, ammonium nitrate, or ammonium chloride should also be given (5 to 8 grams daily) to produce the proper urinary pH. The salt of choice is administered midway between the doses of methenamine. The drug is usually given for a period of one to three weeks.

TOXICITY: Untoward reactions are uncommon. An occasional patient may suffer from skin rashes or gastrointestinal upsets. If large amounts of the drug are used over extended periods, bladder irritation, painful and frequent micturition, albuminuria, and gross hematuria are likely to be encountered.

PRECAUTIONS: There are no specific contraindications to this drug, but it must be remembered that it is useless to prescribe the drug if the urine is not acidic. The drug is useless in such conditions as infections of the meninges, joints, biliary tract, etc., despite its presence in all body fluids and secretions.

MANDELIC ACID — URINARY ANTISEPTICS

DESCRIPTION: Mandelic acid is a simple aromatic acid. It is not oxidized in the body but is excreted unchanged in the urine.

ACTION AND EFFECTS: Mandelic acid has bactericidal properties in an acid medium. The two factors which largely determine the bactericidal effect of mandelic acid are its concentration and the pH of the medium in which it is acting. In clinical practice, the therapeutic objective is to keep the pH of the urine below 5.5 and the concentration of mandelic acid above 0.5 per cent. Mandelic acid is germicidal for E. coli, Aerobacter aerogenes, Pseudomonas, Alcaligenes, Salmonella, and Shigella. Streptococcus faecalis and staphylococcal infections are more resistant to the agent. Infections caused by organisms which split urea to ammonia, for example, certain strains of Proteus and Pseudomonas, do not respond to mandelic acid because it is not possible to make the urine sufficiently acid.

USES: The primary indications for mandelic acid are acute or chronic urinary tract infections due to organisms susceptible to the bactericidal action of the drug. Benefit is usually obtained even if the infection is not entirely eliminated. However, approximately 80 to 90 per cent of uncomplicated urinary tract infections respond to mandelic acid.

PREPARATIONS: The official preparation of mandelic acid is a white crystalline material soluble in water. More commonly in therapy its salts are employed. The official salt is Calcium mandelate U.S.P.

DOSAGE AND ADMINISTRATION: Inasmuch as mandelic acid is completely eliminated by the kidney within a 24-hour period, the dose is so adjusted that the total amount administered in a day, divided by the 24-hour urinary volume, will provide a concentration of drug between 0.5 and 1.0 per cent. The usual dose is 3 grams, four times daily. The daily fluid intake is limited to 1 liter so that the 24-hour urine volume does not exceed 1200 ml. It is usual to continue therapy for 10 to 12 days. If by this time the urine is not sterile, medication is discontinued and resumed only after an interval of 10 to 14 days. The drug should be given after meals to prevent gastric irritation. Children tolerate mandelic acid well.

TOXICITY: Mandelic acid rarely causes serious reactions. Nausea and diarrhea have been infrequently reported. Hematuria is reported in about 1 per cent of the cases and ceases after the drug is withdrawn. A mild systemic reaction, classified as idiosyncrasy to mandelic acid, has been reported.

PRECAUTIONS: Large doses of mandelic acid are likely to cause liver damage characterized by focal necrosis. For this reason, the drug should be employed cautiously in patients with liver damage. The primary contraindication to the use of mandelic acid is impaired renal function. If the drug is not efficiently excreted, severe acidosis and renal damage may result. Poor renal function occasioned by any pathological entity requires caution. Mandelic acid must be given with great care to patients with severe organic heart disease, diabetes mellitus, marked debilitation, and gout. Lastly, it must be remembered that mandelic acid fails to sterilize the urinary tract if the pH of the urine is not sufficiently acidic.

NITROFURANTOIN — URINARY ANTISEPTIC

DESCRIPTION: Nitrofurantoin is a furan derivative. It is a synthetic organic chemical.

ACTION AND EFFECTS: Nitrofurantoin possesses a broad antibacterial spectrum that encompasses both gram-positive and gram-negative organisms. Concentrations of the drug which are readily achieved in the urine are bactericidal to most strains of E. coli, M. pyogenes albus and aureus, S. pyogenes, and A. aerogenes. More resistant organisms include Proteus species, Ps. aeruginosa, and A. faecalis, but nevertheless, these organisms can sometimes be eradicated from the urinary tract.

Nitrofurantoin is rapidly and completely absorbed from the gastrointestinal tract and therefore has little effect on the intestinal flora. Approximately 40 per cent is excreted into the urine. The remainder is catabolized.

USES: Nitrofurantoin is used exclusively as a urinary antiseptic. It is prescribed in the treatment of severe urinary tract infections which have proved refractory to other antibacterial agents.

PREPARATIONS: Nitrofurantoin, N.N.R. (Furadantin) is marketed in scored tablets of 50 and 100 mg.

DOSAGE AND ADMINISTRATION: The average daily dose of nitrofurantoin is 7.5 mg. per kilogram of body weight. This is divided into four portions and administered with meals and at bedtime. The average daily dose of nitrofurantoin results in a urinary concentration of approximately 20 mg. per 100 ml. This amount is readily soluble at an alkaline pH, but pH 5.0 represents the saturation point. Fortunately, however, supersaturation of the urine occurs without crystalluria.

TOXICITY: Nitrofurantoin should not be administered for more than fourteen days continuously, and therapeutic courses should be separated by a rest period of four weeks. The drug has not been associated with serious untoward reactions, but patients should be watched carefully for hypersensitivity until more clinical experience with the agent has been obtained. Nausea and vomiting occur in a small percentage of patients. The incidence rises markedly when the dose is increased.

PRECAUTIONS: An occasional case of sensitization has been noted with nitrofurantoin. Such cases have consisted of a diffuse erythematous maculopapular eruption of the skin. This has been readily controlled by discontinuing administration of the drug.

Animal studies, using large doses administered over a long period, have revealed a decrease in the maturation of spermatozoa, but this effect is reversible after discontinuance of the drug.

Until more is known concerning the long-term effects, blood cell studies should be made during therapy.

Frequent or prolonged treatment is not advised until the drug has received more widespread study. It is otherwise contraindicated in the presence of anuria, oliguria, or severe renal damage.

PYRIDIUM — URINARY ANTISEPTIC

DESCRIPTION: Pyridium is one of the Azo dyes.

ACTION AND EFFECTS: There is considerable difference of opinion as to the effectiveness *in vivo* of Pyridium. Although the compound exhibits bactericidal activity *in vitro*, when ingested it imparts little bactericidal activity to the urine. The Council on Pharmacy and Chemistry has reported unfavorably on the compound. However, some investigators are impressed with its action. It is claimed that following oral administration, Pyridium acts directly on the urogenital mucosa and produces a definite but entirely local analgesic effect on the urinary tract. Through its established analgesic effect on the urogenital mucosa, Pyridium contributes to relaxation of the sphincter mechanism of the bladder.

Clinical studies have reported diminished pain on urination, burning, and nocturia. In addition to evaluating the extent of symptomatic relief obtained with Pyridium therapy, investigators have also studied the previously reported action of this drug in reducing the organized urinary sediment in various urologic conditions.

USES: Pyridium is advocated for use by some investigators for relief of distressing urinary symptoms accompanying cystitis, prostatis, urethritis, and pyelonephritis. This effect is also of value in urologic surgical procedures and diagnostic instrumentation.

PREPARATIONS: Pyridium is marketed as Pyridium Tablets 0.1 Gm. and as Pyridium 1% Solution.

DOSAGE AND ADMINISTRATION: Pyridium is administered orally in tablet form. The average therapeutic adult dose is 0.2 Gm. three times daily before meals. For crystoscopy, crytoscopic diagnostic procedures, and for urethral medication, one ounce of Pyridium 1% solution is injected into the urethra and bladder and held in place with the urethral clamp for a 10-minute period. The solution is then released and a repeat injection of 15 cc. is made and retained for 5 minutes. For local treatment in cystitis and urethritis, Pyridium Solution is a valuable adjunct to oral therapy. Dilutions of 1:8 or greater with distilled water are employed for bladder irrigation, for urethral irrigation, and as a vaginal douche.

TOXICITY: Occasionally a patient may display an idiosyncrasy to Pyridium when orally administered; this usually is manifested by headache, nausea, vertigo, and colic. In some cases, tolerance may be established by temporary reduction of dosage. If tolerance is not promptly attained, Pyridium should be discontinued.

PRECAUTIONS: Pyridium should not be given orally to patients affected with chronic glomerular nephritis, especially those having a low phthalein output. In pyelonephritis of pregnancy when there is a tendency to gastrointestinal disturbance, as well as in severe chronic gastrointestinal disorders, care should be taken in the oral use of the remedy. It should not be given in severe hepatitis, where excretion is very slow, nor in uremia. In patients with a tendency to hyperacidity, the dosage of Pyridium should be regulated and given after, instead of before, meals. In some cases, small doses of sodium bicarbonate may be given an hour before taking Pyridium. The nurse should warn the patient that his urine will be an orange-red color as a result of Pyridium medication.

A well-made bed, pitchers of fruit juice, and an icebag help the patient on bed rest.

Practical Nursing in Influenza

by **Ruth Boyer Scott, R.N.**

WHEN Miss Dahlstrom first made the bed in 302, she thought it was "made." Indeed, she was proud of the results. After bedmaking in practical nursing class, at last she was doing the real thing. Little did she suspect how strongly her impression of "bed" would change to "bed with person."

When she entered 302 with her armload of clean linen, it already had been stripped of used linen. The mattress had been brushed with a firm whisk broom and turned. One of the light wool blankets was neatly folded over a chair back. The other was spread wide over a chair near the window. The faithful person working ahead of her had noticed spilled food on the blanket and removed the spot by using cold water first, then soap and water, then clear water. Now the blanket was clean, dry, and odorless.

Miss Dahlstrom laid the clean linen on the bedside stand, and set the chair with both wool blankets now folded lengthwise over the chair back at the foot of the bed on the same side.

She remembered as she worked to practice good posture and good body use. Particularly, she bent at the hips and kept her shoulders square as she reached. Her instructor, after thirty years of nursing, still had a beautifully young carriage and Miss Dahlstrom was determined to avoid any round-shouldered, hollow-backed droop. .

As she worked, the thought of that unknown patient was always with her. Whoever it would be would need a smooth, long-holding bottom sheet. Working entirely from her "supply" side of the bed, she made a snug square corner at the top of the bed. As the sheet wasn't long enough for a square corner at the bottom, she saw that it came just over the end of the mattress. No patient of hers would shudder over touching an unprotected mattress.

Next, the rubber draw sheet was centered. Patients can be terribly embarrassed when they have an accident with a bedpan and get a mattress wet. The rubber draw sheet would spare them this embarrassment. But rubber sheets are hot, and sometimes they cause a fine, pimply rash on the buttocks, so Miss Dahlstrom made a mental note to remove the rubber draw sheet if her patient had bathroom privileges.

To protect the patient from the rubber draw sheet, Miss Dahlstrom folded another large sheet with top hem to bottom hem. She centered it, with the large hem on top, for looks, and the fold toward the head of the bed for the patient's comfort. Otherwise, one layer of the doubled drawsheet might wrinkle downward uncomfortably.

Now, with one easy motion, she tucked both rubber and cotton drawsheets under. As she laid the top sheet on the bed, she thought of the three top-sheet pointers which would correct errors she used to make in home bedmaking.

First, the top sheet went on wrong side up, which seems wrong, but is correct, because it turns over the blanket. Second, to avoid that amateurish droop of a sheet to the floor, the lengthwise fold of the sheet center went directly to the center of the bed. With an easy movement, she opened and tossed the far half over on the bed. Third—or actually part of second—the top of the sheet was even with the top of the mattress. No scratchy blanket would tickle the chin of her patient, because the sheet would turn over amply.

Now came that skilled nurse trick which makes so much comfort for the patient: toe room. "In some hospitals," the instructor told them, "nurses are taught to make an absolutely tight top sheet, with two square corners at the foot. The patient makes his own toe room, or suffers with pressure. Here, we've chosen between a box-pleat for toe room at the foot of the bed, and a cross-the-bed pleat." The nurses practiced both styles, but decided on the cross-the-bed pleat.

So Miss Dahlstrom centered the blanket and opened it with a toss. Then, at the foot of the bed, she picked up a fold of sheet and blanket, laid them flat, toward the foot of the bed, and tucked both under. Now the lightweight, pastel-color cotton bedsheet went on. While white is still the most commonly used hospital spread, a pastel color, if it won't fade out, is just as sanitary and economical, and quite pretty.

Then, for the first time, Miss Dahlstrom walked around the bed. She neatly laid back the bedding, and beginning at the corner of the bottom sheet, made the second-half in the same way as the first. She particularly gathered both drawsheets tight, and braced her knee against the bed as she tucked them in tightly.

Avoiding the lumpy look and bumpy feel of a pillow which is crooked in its case, Miss Dahlstrom rested each pillow squarely on the bedside table top, and slipped it squarely into its case.

"Most hospitals have a purely artificial rule about whether the open end points toward or away from the door. Some point the bottom pillow away and the top pillow opening toward. The important things are to have it comfortable for the patient—square in and if it is a sponge rubber pillow with a zipper, have the zipper go into the pillowslip first. Then a patient won't feel a cold metal if he wrinkles his pillow case. And, as always, protect your own health; don't ever hold the pillow with your teeth while you're dropping it into the case," the instructor cautioned her class.

Just as the bed was finished, a young man was wheeled into the room. Miss Dahlstrom noticed his flushed feverish look, and the droop of his body which showed exhaustion. "This is Mr. North, Miss Dahlstrom," the admission nurse said. "He's to have complete bed rest. Doctor's orders are at the desk."

Because he was feverish and might need frequent back rubs, she gave him a hospital nightgown, although he had brought pajamas. When he was in bed, she checked the vital signs and recorded, temperature 103° F., pulse 102, respiration, 24, blood pressure 124/84. Mr. North told her that he became chilly in the night and his muscles ached. He took an aspirin, piled on blankets and went into a nightmarish sleep. He wakened with a splitting headache and a fever, and his doctor ordered him to the hospital.

The diagnosis was influenza, often called "flu." Miss Dahlstrom remembered that her parents used to call it "the grippe." Today, people talked casually of it as a "virus," because in-

fluenza virus A or B was the cause. The nurses had been given by hypodermic a vaccine against both A and B because of a report in Europe of a mild epidemic. Epidemics can spread over the world rapidly. As the vaccine only protects for a year, it is used most often for people in delicate health, for nurses and doctors in threatened epidemics, and only for large groups if an epidemic flares up.

"The virus apparently gets stronger in a severe epidemic," the doctor had told them. "Usually we use only precautions of washing our hands carefully after every service to the patient, and handling the dishes separately, with a hot water soak. In severe epidemics, we may use cap and gown and strict isolation, and even so flu scatters rapidly."

By doctor's orders Miss Dahlstrom half-filled an ice cap with ice, squeezed out the air so that it would be comfortable, put the cap on carefully to avoid leaking, and covered it with a light cotton cover for the patient's comfort. She laid it on Mr. North's feverish forehead and he half-smiled in thanks.

In this hospital, the professional nurse gave Mr. North the aspirin, grains x q.i.d. (four times a day) which has long been the standby for flu. Also as ordered, he was given nembutal grains 1½ h.s. (at bedtime) because restlessness is typical of flu.

As the doctor ordered "force fluids," Miss Dahlstrom brought a pitcher of fruit juice, in addition to the pitcher of water which was kept on every bedside stand. She noticed that Mr. North made no effort to drink. So she dropped into the room every half hour and held the glass with the drinking tube low enough so that he could drink without raising his head. She knew Mr. North was in the hospital because he was too sick to be responsible for himself. But he couldn't profit from extra liquids if they stood on his stand because he was too weak to make the effort to help himself.

In two hours she discovered, while helping him drink, that the ice was completely melted. A high fever melts ice much faster than a normal temperature. She took the cap to the utility room, laid it on a paper to avoid any contamination from infection, refilled it half full with cracked ice, and turned it upside down after it was closed, as a test for leakage. She carefully discarded the paper into the incinerator.

Back in Mr. North's room, she found he had a nosebleed which had stained the spread. Nosebleed (epistaxis) is common in influenza but usually not serious. The logical and simple treatment of holding the nostrils gently shut with the fingers stopped it quickly.

Then Miss Dahlstrom brought a clean spread and changed the soiled one, putting it immediately to soak in cold water. While blood usually comes out easily if soaked at once in cold water, delay or the hot water of the laundry can set a stain which is difficult to remove.

The diet for influenza may be liquid or soft, as tolerated by the patient. Mr. North selected the liquids himself, drinking his soup and coffee and leaving his custard. The nurse noted this for the chart, so that he would be offered a liquid diet until he improved enough to want a soft diet.

When Mrs. North arrived, at visiting hours, Miss Dahlstrom noticed that she was expecting a baby. She said, gently, "Your husband is having fruit juice or water frequently, and that ice cap is helping his comfort. Why don't you just wave from the door, so he'll see you're all right?"

While flu, when treated promptly in young people, is rarely fatal, it can be dangerous to old folks, babies, and sometimes to expectant mothers.

Reassured that her husband was having ample attention, Mrs. North did wave and then went home. Good nursing was protecting both her husband and herself.

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WRITE: *Director of Nursing*
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Baltimore 5, Maryland

(Continued from page 18)

type of dressing can be reinforced with a folded piece of wax paper large enough to line the girdle or supporter. Of course, when the patient leaves the hospital, he will still have to use the combines just as he did while in the hospital. It is only when the colostomy is entirely healed that he can wear the simple kleenex-wax-paper dressing.

17. How much water should be used during the irrigation?

There has been much controversy concerning the amount of water to be used during an irrigation. The trend seems to be away from the 6-8 quart idea. Three quarters to a quart and a half of water was sufficient for the complete emptying of my colon.

18. What should be the temperature of the water?

The water should be tepid—about 105 degrees F.

19. Should any solution be used in the water?

My doctor feels that it is unwise to use solution in the water.

20. When is the best time to irrigate?

Obviously, the best time for a patient to irrigate is when he is most relaxed. For a person who is working, night time is the best. If he is tired after the irrigation (and there is a certain amount of fatigue involved) he has the entire evening in which to rest. *Each patient must find the time best suited to his needs.*

21. How long should the irrigation take?

The entire procedure which includes preparation, inflow, outflow, bath, and washing of instruments should take approximately one hour if done properly.

22. How can constipation be avoided?

Constipation, in my case, was avoided by the intake of raw fruits and vegetables every day. Twelve hours before the irrigation it was necessary for me to take some fruit. When this failed to relieve constipation, I took a teaspoon of milk of magnesia.

23. How can diarrhea be avoided?

Diarrhea can be avoided by not eating too many raw fruits or vegetables and by avoiding iced drinks, over-eating, or eating at odd times.

24. What can a patient do if he has spillage?

If a patient has spillage he should go to the bathroom and clean the colostomy. Following this, I used a kleenex twist and usually found that it provided adequate protection. But when this was unsatisfactory, as a last resort, my doctor ordered 10 drops of opium which was to be taken long before the irrigation. Otherwise I had to wait or else irrigate an hour or two earlier.

25. What sort of mental help can be given to the colostomy patient?

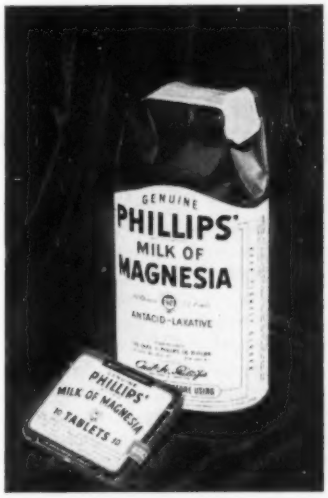
Assurance by another patient who has successfully overcome the problems that face the colostomy patient is one of the best ways to help him conquer fear and anxiety.

I keep in touch with patients as long as they need me. There are so many perplexing problems for the novice to master, the first of these being fear and anxiety. Then he must master the details of the irrigation so that he can proceed without error. He must also be familiar with the diet that will keep his colon sufficiently active so that it will be thoroughly emptied at the time of the irrigation. He must eventually learn how to face life's problems in spite of his handicap. This takes patience, courage, and proper guidance.

Conclusion

It is definitely clear that the colostomy patient needs help. When I followed through all these experiences and findings with the patients which Dr. Breidenbach allowed me to take care of, I realized the great need for passing this knowledge on to others with the hopes that it will serve as a basis for early rehabilitation of the colostomy patient.

An Ideal Antacid-Laxative



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THE BOOK SHELF

Anna V. Matz, R.N.,
Public Health Nursing Consultant,
New York City Department of Health

You and Your Child's Health.

By Paulette Kahn Hartrich. Foreword by Milton I. Levine, M.D. Harper and Brothers, New York, 1955. Pages 208. Price $3.00.

During the growing up process, all parents experience problems of illness with their children. The development of wholesome attitudes toward health requires guidance and direction. Most parents do not possess skills which will enable them to teach their children how to cope with their illness. When illness occurs, many look to the hospital or public health nurse or the social worker for help in resolving the physical and emotional problems that follow a prolonged illness or admission to a hospital.

The author of this helpful book has a varied background of experience in the area of family living. As a family case worker and mother, she draws upon her own anxieties and fears and shows how to channel these constructively. The main features of the book are centered upon the management of physical illnesses and the preparation of children for immunizations, the doctor, the dentist, operations and the hospital. Children anticipate these experiences with fear. Emotional upsets may follow an operation or a prolonged illness. They need the comforting presence of their mothers to reassure them and to help them outgrow their immature behavior. This approach is contradictory to the rigid visiting schedules imposed by many hospitals in the belief that children are better managed when their parents are not around. Psychiatric pediatricians and psychologists have studied the problem and have pointed out that illness combined with separation from the mother is a difficult situation and one which a young child cannot handle by himself. Oftentimes, treatment and recovery are delayed when there is emotional trauma caused by the separation from his mother.

In Chapters V, VI, and VII, dealing with management of children in hospitals, realistic and practical suggestions are offered which are valuable to nurses in guiding parents and giving them the help they need. Specific illustrations of case studies portraying how children actually feel are interwoven throughout these chapters. Ways of successfully meeting these problems with sympathy and understanding as well as suggestions for keeping a child entertained and amused are described. There is a long list of helpful hints on play activities.

While the book was written to give helpful guidance to parents, it cannot be eliminated from nursing bookshelves. All nurses engaged in working with children should be familiar with the contents so that they can counsel parents in meeting these problems. It is an interesting book and well written. There is an appendix listing agencies where parents can seek guidance and counseling help and a list of other reading materials on the subject for parents, as well as an annotated bibliography on the subject.

The Principles and Practice of Surgical Nursing.

By D. F. Ellison Nash, F.R.C.S., Assistant Surgeon, St. Bartholomew's Hospital, London; Senior Surgeon, Children's Hospital, Sydenham; Consultant Surgeon, Chailey Heritage Hospital; Lecturer in Surgery, Demonstrator of Practical Surgery, St. Bartholomew's Hospital Medical College; formerly Hunterian Professor, Arris and Gale Lecturer, Royal College of Surgeons; Examiner in Surgery, Queen's University, Belfast, and in the Faculty of Dental Surgery, Royal College of Surgeons. The Williams & Wilkins Co., Baltimore, Maryland, 1955. Pages 1007. Price $7.00.

Improved operative procedures, better methods of administering anaesthesia and control of bacterial infections have had profound effects on nursing care of the surgical patient. This has given rise to a broader approach in meeting the needs of the surgical patient and to the development of specific skills and procedures for his care. The author regards nursing as a highly specialized discipline and considers the nurse as a member of the surgical team. For this reason he emphasizes basic principles underlying surgical procedures instead of stressing development of specific nursing care.

The book is comprehensive in scope, covering basic principles of treatment vitamin therapy, drugs, anaesthesia, fluid replacement, principles of blood clotting and anticoagulant therapy, preoperative and postoperative care, pathological investigations, asepsis and sterilization, and surgical procedures related to various systems. Nursing is integrated throughout the book and procedures can be developed easily for care of the patient in the hospital. Teaching of the patient and rehabilitation are two areas which are not given much emphasis. With early ambulation, it is important that the patient be given some responsibility for his care. The book has excellent illustrations which enhance its value. It is intended as a text for basic schools of nursing and as a reference for surgical nursing.

Nutrition for Practical Nurses.

By Phyllis S. Howe, B.S., Nutrition Instructor, West Contra Costa Junior College, Richmond, California. W. B. Saunders Company, Philadelphia, 1955. Pages 174. Price $2.50.

Food is a vital component in the life of the human organism. New scientific facts are continually evolving from research laboratories in nutrition; the application of these facts is important for healthier living.

The author of this book presents essential facts about nutrients in simple, meaningful, and non-technical terms. Basic principles of food composition, preparation of foods and their capacity for influencing life processes are very well covered and reinforced by figures and some interesting tables. There are excellent chapters on Menu Planning, National and Religous Food Habits, and Diet Therapy.

The book itself is divided into three sections: Section I—Normal Nutrition; Section II—Diet Therapy; and Section III—Selection and Care of Foods. At the conclusion of each chapter, there are short exercises for review. The book is specifically written for practical nurses. Because of its conciseness, easy readability, interest and fine presentation of subject matter, it can well serve as a model for teaching nutrition to lay groups by professional nurses.

Practical Nursing Directory

This directory of national and state associations is included as a service to our readers. It will appear in the January and July issues—Editor.

National Organizations

National Association for Practical Nurse Education

President, Miss Fern Goulding, School of Practical Nursing, Indianapolis Public School, 501 So. Meridan Street, Indianapolis, Indiana.

Exec. Director, Hilda M. Torrop, Suite 803, 654 Madison Ave., New York 21, N. Y.

National Federation of Licensed Practical Nurses

President, Mrs. Margaret Baird, P. O. Box 7216, Richmond 21, Va.

Exec. Director, Mrs. Lillian E. Kuster, 250 West 57th St., New York 19, N. Y.

Secretary, Miss Anna A. Kennerup, 115 No. 16 St., East Orange, N. J.

National League for Nursing, Interdivisional Committee on Practical and Auxiliary Workers in Nursing Services

Secretary, Mary Shields, National League for Nursing, 2 Park Ave., New York 16, N. Y.

State and Territorial Organizations

Alabama

Licensed Practical Nurses Association of Alabama:

President, Mrs. Carrie Mae Crew, 6812 S. Frankfort Ave., Birmingham 6, Ala.

Secretary, Mrs. Irene Bickley, 1009 So. Augusta, Mobile, Ala.

Colored Licensed Practical Nurses Association of Alabama:

President, Mrs. Edna J. Price, 333-14 Court N., Birmingham 4, Ala.

For licensure apply to:

Dorothy Foley, Exec. Officer, Nurses Examining Board, 402 Monroe St., Montgomery 4, Ala.

Alaska

Mount Edgecumbe Graduate Practical Nurse Group:

President, Mrs. Emma Kohler, Box 87, Mt. Edgecumbe, Alaska.

Secretary, Mr. Phillip Moreno, P. O. Box 821, Mt. Edgecumbe, Alaska.

For licensure apply to:

Examining Board, Mrs. La Pearl Bie, Sec.-Treas., Box 714, Seward, Alaska.

Arizona

Arizona Federation of Licensed Practical Nurses:

President, Mrs. Annie M. Lamb, P. O. Box 504, Prescott, Arizona.

Secretary, Mrs. Naomi Horstam, 219 N. Alacron St., Prescott, Arizona.

For licensure apply to:

Mrs. Frieda B. Erhardt, Exec. Sec., Arizona State Board of Nurse Registration and Nursing Education, State House, Phoenix, Arizona.

Arkansas

Arkansas State Practical Nurses' Association:

President, Mrs. Eliza Stegall, Box 354, Clarksville, Ark.

Exec. Director, Mrs. Georgia Lee Russell, 311½ North State St., Little Rock, Ark.

For licensure apply to:

Marion E. Carpenter, Sec.-Treas., Arkansas State Board of Nurse Examiners, 1016 Pyramid Bldg., Little Rock, Ark.

California

California Licensed Vocational Nurses' Association, Inc.:

President, Mrs. Lura Bryant, Room 207, 2030 Bradway, Oakland 12, California.

Secretary, Mrs. Catherine Matthews, 707 North Park Ave., Pomona, California.

For licensure apply to:

Board of Vocational Nurse Examiners, Room 1020 "N" St., Sacramento 14, California.

Colorado

Practical Nurses' Association of Colorado:

President, Mrs. Mary L. Wickerham, 319, South College Ave., Fort Collins, Colorado.

Exec. Secretary, Clara Wiegel, 1685 S. Lincoln St., Denver 10, Colorado.

Secretary, Mrs. Maude Dunson Hogg, 2246 Emerson St., Denver 5, Colorado.

No licensure provided.

Connecticut

Connecticut Licensed Practical Nurses' Association, Inc.:

President, Mrs. Gwendoline Johnson, 327 Trumbull St., Room 14, Hartford.

Exec. Sec.-Treas., Miss Harriet S. Meggat, 327 Trumbull St., Room 14, Hartford.

For licensure apply to:

Agnes Ohlson, R.N., Dept. of Nursing Examiners, No. 145 State Office Bldg., Hartford.

Delaware

The Delaware Practical Nurses Association:

President, Mrs. Virginia Duling, 20 West 37th St., Wilmington, Del.

Corr. Sec., Mrs. Gertrude P. Dennell, 1404 W. 6th St., Wilmington, Del.

For licensure apply to:

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Secretary, Mrs. Lura C. Ford (same address as above.)

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Corresponding Sec., Henry J. Schifferli, P. O. Box 314, Coconut Grove Sta. Miami 33, Fla.

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Secretary, Marilyn Delmar, 120 Summit Ave., St. Paul, Minn.

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Acting Exec. Sec., Mrs. Christine B. Quell, 250 West 57th St., New York 19, N. Y.

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Secretary, Mrs. Helen Graham, 10613 Cedar St., Cleveland.
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Secretary, Erma Berry, Exec. Sec., Okla. State Board of Nurse Examiners, 803 Cravens Bldg., Oklahoma City 2, Okla.

Oregon

Oregon Licensed Practical Nurses' Assn.:
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Acting Secretary, Pearl Olson, 9425 N. Richmond Ave., Portland, Ore.
For licensure apply to:
Donna M. Monkman, Exec. Secretary, Oregon State Board of Nurse Examiners, 778 State Office Bldg., 1400 S. W. 5th Ave., Portland, Ore.

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Secretary, Mary Patterson, 807½ Thomas Ave., Johnstown, Pa.
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Attendant nurses apply to:
Pennsylvania State Board of Nurse Examiners, Room 359, Education Bldg., Harrisburg, Pa.

Puerto Rico

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Corr. Sec., Mrs. Oreita Grimes, Route 7, P. O. Box 690A, Fort Worth, Tex.
For licensure apply to:
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Secretary, Elouise Sundall, 1105 S. 8th East, Salt Lake City.
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Practical Nurse Association of Virginia:
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Exec. Secretary, Mrs. Margaret Baird, P. O. Box 7216, Richmond.
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Secretary, Mrs. Hazel Jackson, 2819 Griffin Ave., Richmond.
For licensure apply to:
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Secretary, Mrs. Blanche Hall, P. O. Box 2862, S. Charleston, W. Va.
West Virginia Practical Nurses' Association (Colored):
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Corr. Secretary, Mrs. Mildred Washington, 415½ Greenway Ave., S. Charleston, W. Va.
No licensure provided.

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Wisconsin State Practical Nurses' Association, 161 W. Wisconsin Ave., Room 7156, Milwaukee 3, Wis.:
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Secretary, Mrs. Martha Koch, 936 N. 25th St., Milwaukee, Wis.
For licensure apply to:
Adele G. Stahl, R.N., Director of State Dept. of Nurses, 119 Monona Ave., Room 609, Madison, Wis.

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WE PREPARE FOR POLIO IMMUNIZATION

(Continued from page 11)

were introduced in the course of the program, the nurses were kept aware of them.

Records

Written reports on the amount of vaccine used and the number of inoculations given were made by the volunteers and nurses on a form which was returned with the supplies by the volunteers at the end of each session. In addition, at that time a telephone report on the number of inoculations given was made to the district office by the volunteers. These reports from the various schools were immediately collated and the total number of inoculations given in the district was reported, also by telephone, to the central office which made prompt use of these figures in its daily city-wide publicity. A final written report was submitted by the district health officer at the conclusion of the program.

In order to keep accurate control of the vaccine, the vials were counted out to the transportation volunteer who called at the health center for them and who signed a receipt for them. Thereafter, each time the vaccine changed hands the recipient signed the receipt which was finally signed by the clerk at the health center when the excess vaccine was returned.

By careful scheduling it was possible to reach every school in this enormous district with its huge enrollment in nine days. A few public, private and parochial schools, which had too few pupils for a complete setup at their own schools, sent their pupils to nearby large public schools. For those children at each school who, for one reason or another, missed their inoculation, a session was later arranged at a convenient school in each neighborhood. In this period of fourteen working days, inoculations were given to over 24,000 children.

Since at the termination of this program there was a small amount of vaccine still available, it was decided to give a second dose to those children who had received the placebo in the 1954 trial and who had received their first injections in this program. About two weeks later, arrangements were made for this to be done at the health center and at eleven schools in the district. Schedules were prepared and sent to each principal informing him where and when eligible pupils might receive their inoculations. A total of 7,287 children received their second injections.

Vaccine did not again become available until the fall. In October, second inoculations were given to all the remaining children who had recived a single injection. These were again given in clinics organized in the schools. The total number of children receiving second injections was 22,372 or better than 92 per cent completion of the group started in the spring. Already, preparations are being made to extend the immunization program to all children from kindergarten through the fifth grade.

It is felt that this is remarkable evidence of the soundness of the educational work that has been done in the district on this new health protection measure.